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SPECIAL DOUBLE ISSUE
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The Importance of Being Resilient

Looking Back, and Forward

Ten years after Hurricane Katrina, New Orleans has found its stride again with help from Zurich Insurance Group

Zurich Insurance Group gleaned many valuable lessons from Hurricane Katrina, and cities are more resilient as a result.

Ten years ago, Zurich Insurance Group (Zurich) became the title sponsor of the PGA TOUR's annual New Orleans golf tournament. The Zurich Classic of New Orleans made good business sense: A leading global insurance provider sponsoring an event with a star-studded field in a beloved international city. Following the successful tournament in 2005, Zurich was pleased with the various branding opportunities, and the ability to interact with its customers and brokers throughout the week.

Then Hurricane Katrina struck, and all bets were off. On the heels of one of the five deadliest hurricanes in U.S. history and the nation's costliest natural disaster, Zurich was well within its contractual rights to pull out of its sponsorship deal. Yet the company quickly decided that this would be the wrong course of action, given its business, its history and its mission.

"Our CEO at the time said, 'Let's bring the swing back to New Orleans,'" recalls Zurich North America Commercial CEO Mike Foley. "We decided to double down and be truly committed to New Orleans."

In the spring of 2006, the Zurich Classic became the first major sporting event to return to the city following Katrina, signaling to the world that New Orleans was once again open for business. A decade later, Zurich's deep, abiding dedication to the Crescent City has helped it regain its footing. The tournament continues to bring an estimated $40 million in economic value to the city annually, and has helped Zurich give back nearly $19 million to more than 100 local children's charities.

Zurich's decision to stick by New Orleans in its time of need also helped the company learn a great deal about catastrophic risk. In the wake of Katrina, the insurance provider—which handled more than 11,000 Katrina-related claims, and publicly reported estimated after-tax losses of $600 million as a result—gleaned many lessons from this epic disaster.

Today, Zurich silos this knowledge into pre-event, during-event and post-event buckets. Some recommendations apply year-round, but all take as their starting point helping Zurich's customers better prepare for disruption to reduce potential losses. For example, when a large storm is on the horizon, Zurich employs the latest modeling methods to identify its trajectory, and overlays information about customers' locations to give the company the best view of which are likeliest to be impacted.

"Post-Katrina, we now call all of our brokers and customers when we see a major storm making its way toward a city," says Foley. "We reach out and remind them of key preparations."

This risk mitigation advice includes simple but often-overlooked actions, such as moving valuable equipment, especially generators, from basements to higher ground. Zurich also shifts hundreds of claims professionals to staging areas near an expected impact area, and after Katrina the company established its Risk Engineering Response Team to help customers reduce their overall risk, with these specialists visiting customers whenever it's safely possible to offer guidance on imminent preparation steps. The list of in-storm and post-storm lessons is similarly comprehensive.

Among the most important lessons that came out of the Katrina tragedy is an old truism: *An ounce of prevention is worth a pound of cure.* "The research says that every dollar spent on disaster preparedness saves five dollars in future losses," says Foley. "It's five times more effective to invest upfront than it is to recover after the fact. That's one of the keys to building more resilient communities." *—Evan Rothman*

"The research says that every dollar spent on disaster preparedness saves five dollars in future losses. It's five times more effective to invest upfront than it is to recover after the fact. That's one of the keys to building more resilient communities."


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"So Europeans hate Google?"

"Actually, it's much more popular in Europe than in the U.S. But some industry competitors, publishers, and politicians are leading the cause."

"I knew they'd hate it. Every man, woman, and child in Europe ... disgusted by Google. Astounding."

2 "A violent WWII-style battle, but this time the enemy is IN the computer."

"I rarely say this, but that seems like an overstatement."

3 "Graffiti over Larry and Sergey as if painted by a precocious European rabble-rouser."

"Might be confusing."

4 "In America you throw tomatoes, but in Europe you'd throw baguettes and pasta—because that's what they eat there."

"Maybe food isn't the best way into a tech story."

5 "A glitch inside Google maps, and the type can be made of pasta."

"No pasta. Otherwise fine."

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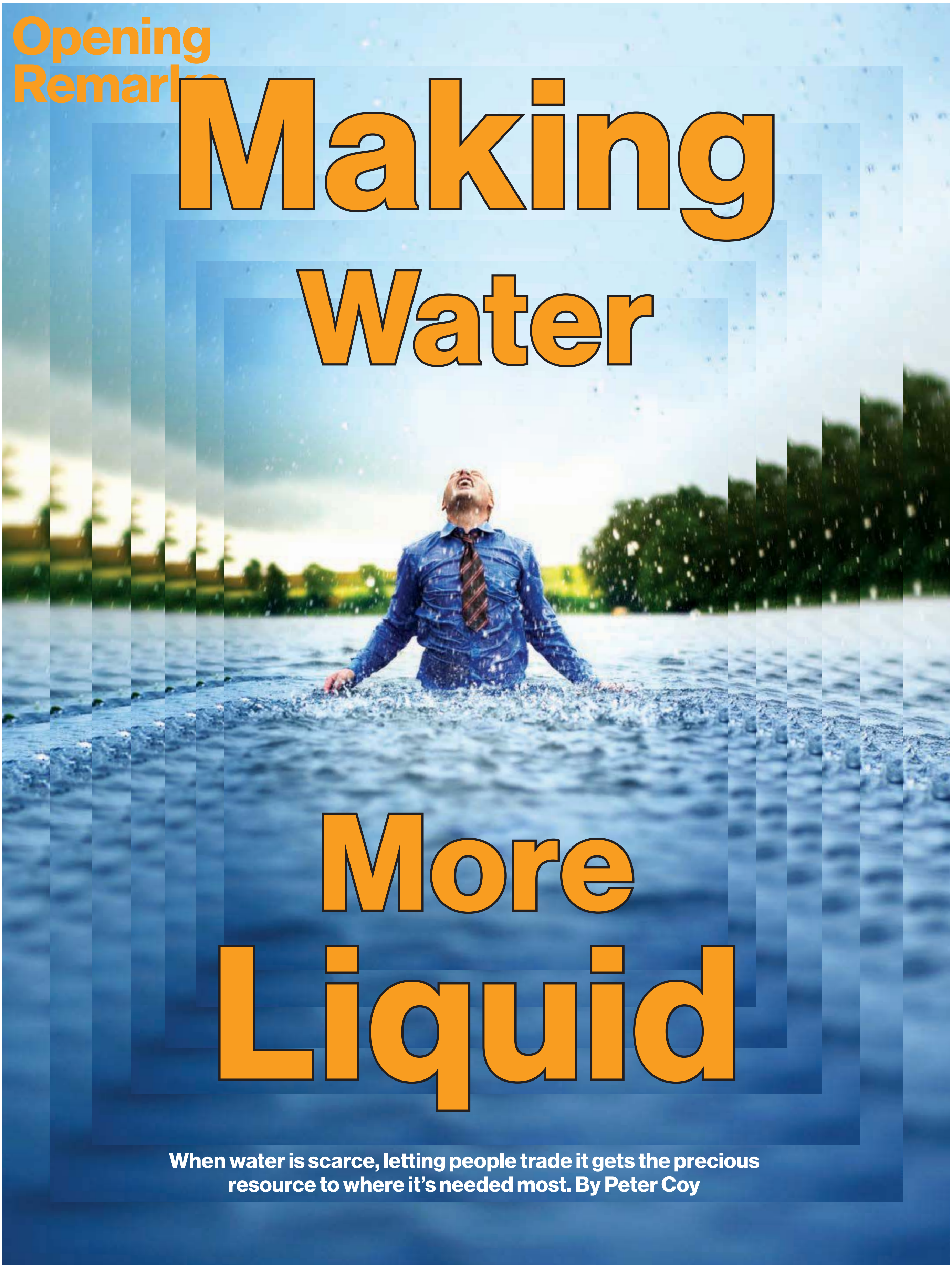

When water is scarce, letting people trade it gets the precious resource to where it's needed most. By Peter Coy

California's water-rights system dates back to the gold rush, when miners diverted mountain streams

The water wells in the rich farmland of California's Central Valley keep getting deeper, and the pumps keep getting more powerful. Farmers have agreed to reduce their usage of surface water, but nothing stops them from looking for water beneath their properties. So, in the fourth year of a devastating drought, down they go, pursuing a water table that keeps receding. So much water is being pumped out that the land is subsiding, damaging bridges and canals. One Central Valley cotton farmer has drilled five 2,500-foot wells, each the depth of two Empire State Buildings, the *San Jose Mercury News* reports. It's literally a race to the bottom.

What's going on in the Central Valley is a tragedy of the commons. As with overfishing or overgrazing, the drilling farmers overexploited a free, shared resource even before the drought struck. Individually, their logic is impeccable. Collectively, it could be disastrous. In that respect, the Central Valley is a microcosm of an increasingly parched world that hasn't learned how to manage one of its most precious resources. A NASA study released in June said that "about one-third of earth's largest groundwater basins are being rapidly depleted by human consumption."

People have been puzzling over how to share water for as long as civilization has existed: No one really owns the stuff. It refuses to be tamed, cycling restlessly from air to land to sea. In some times and places it's precious, in others excessive.

An important step toward resolving conflicts over water is to make it liquid, financially speaking. Water today is illiquid in the sense that the right to use it can't be transferred easily. California's mechanism for trading water is slow, clunky, and opaque. "If you wanted to do a trade now, you'd have to meet a broker in a coffee shop somewhere. There's no *Wall Street Journal*, no Bloomberg, no Carfax," says Richard Howitt, a scholar at the University of California at Davis's Center for Watershed Sciences.

A free market in water can't exist without clearly defined property rights. California lacks that for groundwater, relying on the courts to sort out conflicts. That leaves farmers furiously trying to outpump each other. A state law passed last year will gradually bring groundwater under regulation, but it doesn't fully phase in until 2040. "I'm a market animal. I'm a money manager. But having efficient market forces requires a rational regulatory body," says John Dickerson, founder and chief executive officer of Summit Global Management, a water-business investor in San Diego.

California does have a system for regulating surface water, one that dates back to the 19th century gold rush, when miners diverted water from streams to pan and sluice for gold. The state's water law is based on the old miners' code: first in time, first in right. Since 1914 a state agency, now the State Water Resources Control Board, has overseen allotments. Senior rights holders get first dibs on a certain quantity of water based on their historical use. Water rights go with land when it's sold. That's a workable basis for a trading system because it establishes a property right. (In the wetter Eastern states, where control of water is less of an issue, a vaguer "reasonable use" standard applies.)

California's system needs some serious modernization, though. It encourages waste by dictating that water not used this year is forfeited in the future. Courts and the legislature have made clear that farmers won't lose their water rights if they sell water when they have extra, but some potential sellers remain leery. More important, the state water board must determine exactly how much water holders are entitled to sell. This is necessary because historical allotments of "paper water" far exceed the actual amount of water that California gets, even in nondrought years. Progress is being made: For the first time, senior rights holders are being required to report their water usage annually—and to document their historical rights.

Physical obstacles to trading must be removed, too. Water gets stranded in the wet north of California because it's hard to move southward past the delta of the Sacramento and San Joaquin rivers, the vast estuary east of San Francisco Bay. Governor Jerry Brown supports building bypass tunnels beneath the delta, but that could cost $17 billion and upsets some environmentalists, who fear the delta will be degraded.

Nothing is easy. Irrigation districts, controlled by agricultural interests, sometimes reject water sales to cities by willing member farmers. The ag interests fear that allowing farmland to go fallow will wreck the farm economy, says Clay Landry, managing director of WestWater Research, a water marketing and consulting firm in Boise, Idaho. With a few exceptions, California has done a poor job of helping rural communities make the transition from farming to other ways of earning a living. So they stick with what they know. The upshot is a sclerotic system in which only about 5 percent of California's water is traded, and most of that among close neighbors.

If California's water were fully liquid, more would be flowing to urban areas and less to agriculture, which generates 1.5 percent of the state's gross domestic product but accounts for 80 percent of the water used by people (i.e., not counting water spared for "use" by nature). The state would need to build fewer costly desalination plants, such as the $1 billion San Diego County plant starting up this fall.

The mix of agriculture would probably continue to shift toward high-value vineyards, orchards, and tomatoes and away from corn, rice, and alfalfa, which need lots of water but fetch low prices and can be grown elsewhere. Farmers given an incentive to conserve water would be quicker to fallow their marginal fields or shift to less thirsty crops. Some types of farming might migrate to water-rich parts of the country—like Iowa, a grain-growing state that's begun experimenting with vegetables. To protect endangered species, government and environmental groups could step up purchases of water rights to keep streams and wetlands full.

Australia shows what a water market can achieve. There, water rights are traded on an exchange like stocks, prices are posted for all to see, and transactions can be concluded in a day. Allocations are based mainly on a share of what's actually available, not unrealistic fixed amounts. Farmers in the fertile Murray-Darling Basin of southeastern Australia almost completely stopped producing rice during the Millennium Drought last decade and switched to higher-value crops to keep making a living. University of Adelaide professor Mike Young says the market became possible when farmers chose streamlined water rights and surrendered their tangled old ones. "America is the home of free enterprise," he says. "The fact that there's not a water market in America means the institutional arrangements are all wrong."

California captures enough water each year to meet all its needs if it operates efficiently—a big if. Water usage is already falling. Gradually, "markets are doing what markets do," says WestWater's Landry. "There's learning, information sharing, creativity, and discovery." The drought is speeding up the process. "What causes change more than anything is crisis," Thomas Howard, executive director of the State Water Resources Control Board, told Bloomberg earlier this year. "I do see us making progress and moving toward the ideal system." If not, there's always Plan B: Pray for rain. Ⓑ

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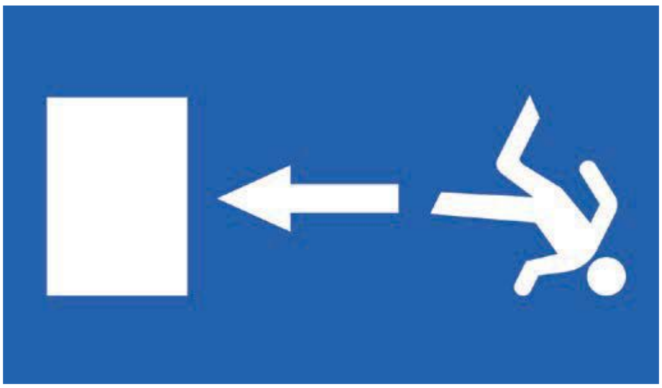
No Way Out for Greece Without Debt Relief

Germany and other creditors should offer a navigable path to recovery



Keeping Greece inside the euro system was a questionable decision at best, but, having chosen that course, the country's government and creditors are obliged to make it work. Early signs aren't encouraging. When the Athens Stock Exchange opened on Aug. 3 for the first time in five weeks, it tanked. Factory production, according to new figures, is in its deepest slump in years.

The International Monetary Fund told its board in late July that the fund couldn't participate in the next Greek bailout unless the other creditors agreed to another round of debt relief. But Germany and other creditors oppose such a step, while insisting that the next program can't happen without the IMF.

When Greek Prime Minister Alexis Tsipras capitulated to the creditors' demands last month, he thought he'd struck a deal. Not for the first time, he was mistaken. Tsipras already has his work cut out to deliver his part of this vaporous bargain. Parliament has passed two big packages of economic measures, including controversial tax increases and pension reforms. The creditors next want to see those implemented and are pressing for new privatizations and other changes, too. Greece is likely to need bridge financing for a payment to the European Central Bank next month, and the European Union may impose new conditions in return for providing the financing.

The ruling Syriza party, deeply divided over the concessions, is on the verge of splitting. If it does, Tsipras would probably have to call an election. While this confusion lasts, there's little hope of a revival in confidence or investment—and a slim chance of the broader recovery that Greece so desperately needs.

The threat of a new financial crisis was bound to persist. Greece has serially defaulted on loans and policy commitments. In extending more help, the creditors would be mad not to set conditions and closely monitor compliance. Nonetheless, a strategy that offers Greece a navigable path to recovery isn't too much to ask. As yet, no such strategy exists.

The creditors should agree right now on the principle that debt relief will be forthcoming so long as Greece negotiates in good faith and tries to keep its promises. Otherwise, with or without IMF involvement, the new program is likely to fail.

Germany and its supporters among EU creditors will have to budge. Their claim that the rules of the euro area forbid debt relief is hard to take seriously: The rules are plenty flexible. Convincing voters in Germany and other countries that debt relief is in their own interests is another matter, not least because the governments concerned have been saying the opposite for months.

Yet the price of persisting with the no-debt-relief line is too high: further damage to the flattened Greek economy, followed by the failure of the new program, and, in due course, nonpayment of the debts in question. Surely that's not the ultimate goal of Greece's creditors. What they need to do, then, is stop taking steps to make it the most likely outcome.

The Inadequate War On Alzheimer's

Funding to fight cancer and AIDS dwarfs what's spent on this disease

Alzheimer's research had a small victory recently, when two new drugs were found to possibly slow the disease's relentless attack on brain cells. But the search for a cure isn't moving nearly quickly enough.

Alzheimer's kills about 100,000 Americans a year and undermines the final years of some 5 million more. Care for the afflicted accounts for almost one-fifth of Medicare and Medicaid spending; by 2030, that's expected to reach almost half a trillion dollars a year. Alone among the most widespread diseases, Alzheimer's has no proven treatment, much less a cure. Drugs exist to mitigate symptoms, but no new ones have been approved since 2003.

Money seems to be one obstacle. Considering the severity of Alzheimer's and the number of people who suffer from it, the disease gets relatively little research money. This year, the National Institutes of Health, the chief U.S. funder for medical research, will spend almost 10 times as much on cancer research as on Alzheimer's—even though just four times as many people have cancer—and it will spend five times as much on HIV/AIDS—even though only twice as many people have AIDS as have Alzheimer's. No wonder the number of deaths from Alzheimer's continues to increase as deaths from other major diseases decline.

Charitable contributions toward Alzheimer's research also lag those of other causes. For every dollar raised in 2012 for cancer research, groups dedicated to Alzheimer's raised 3¢, according to the Urban Institute's National Center for Charitable Statistics.

One way to make Alzheimer's a greater priority is to force Congress to focus on it. A law passed last year requires that the NIH send annual funding requests for Alzheimer's research directly to the president and lawmakers, bypassing the governmentwide budget process. Lawmakers may also want to consider that taxpayers will end up paying either way. Medicare and Medicaid will spend $153 billion caring for patients with Alzheimer's and other kinds of dementia this year, about 261 times what the NIH will spend looking for ways to prevent and cure the disease. Until one is found, these numbers are way out of balance. Ⓑ

ILLUSTRATION BY OTHER MEANS

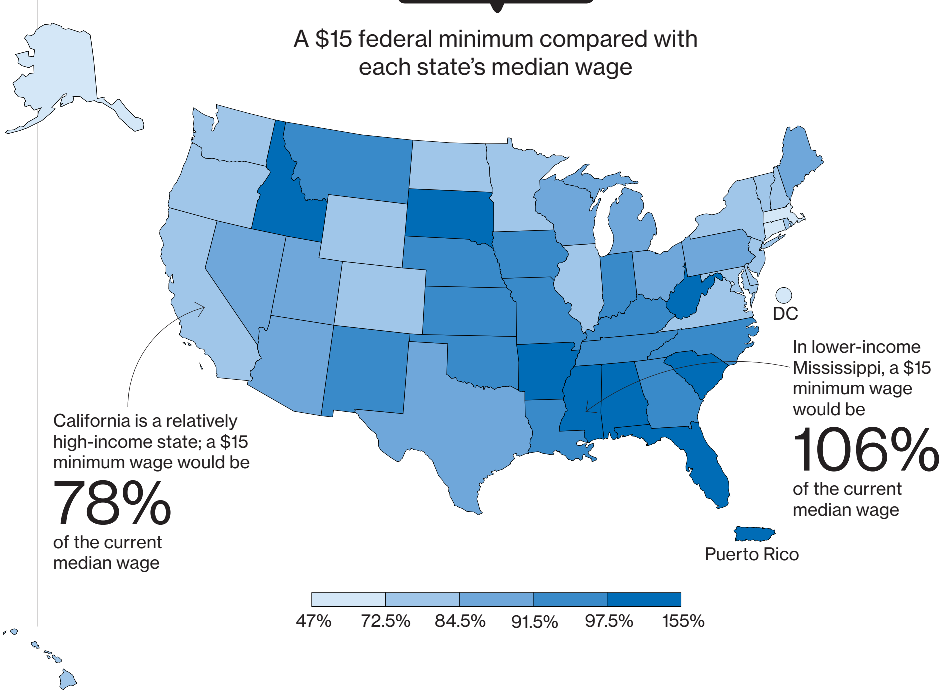
Is a $15 Minimum Wage Too High?

▶ Many economists say it wouldn't work nationwide

▶ "We have no experience with an increase...of that size"

The Impacts Vary

A $15 federal minimum compared with each state's median wage



As the proposed federal minimum wage goes up and up, economists support it less and less. In January 2014, seven Nobel laureates and eight ex-presidents of the American Economic Association signed a letter backing a federal minimum wage of $10.10 an hour by 2016, up from $7.25. They said it would "provide a much-needed boost" to low-income workers while causing "little or no" job loss. Fifteen dollars an hour is another story. None of those luminaries signed the letter in July that endorsed a Senate bill introduced by presidential candidate Bernie Sanders (D-Vt.) to raise the federal minimum to $15 an hour by 2020.

Regional economic differences are one reason a lot of economists are nervous about jumping to $15: A wage floor that's right for New York or San Francisco could be too high for Brownsville, Texas; Gadsden, Ala.; or Ponce, Puerto Rico. In such places, $15 an hour "may have large negative employment effects," Ronald Ehrenberg, a Cornell University labor economist, wrote in an e-mail. He was one of about 600 economists who signed the $10.10 letter last year. He says he wasn't approached to sign the $15 letter but would have said no if asked.

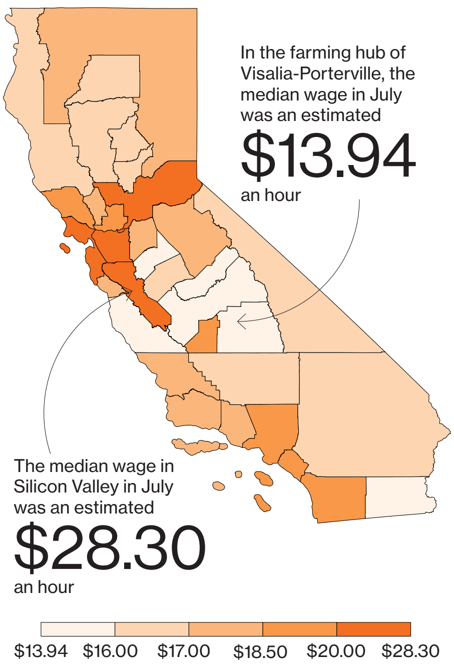
A $15 minimum is just 67 percent of the median wage in high-cost Alaska, so it would have a modest effect if implemented today, lifting pay of people at the bottom but not affecting the middle rungs of the income ladder. In Puerto Rico, though, $15 is 155 percent of the median wage. If the federal minimum were raised to $15 today (rather than in 2020, as Sanders proposes), it would be 55 percent higher than the midpoint of what all Puerto Ricans earn. That would cause severe stress in a financially struggling territory already squeezed by the $7.25 minimum. Even within a single state, it's hard to come up with a minimum that works everywhere. In California, the median wage varies from more than $28 an hour in Silicon Valley (technically San Benito and Santa Clara counties) to less than $14 in Visalia-Porterville, a farm town 190 miles away by car.

Those who argue for a high federal floor say that $15 won't cost many jobs even in low-wage parts of the country because minimum-wage workers are productive enough to justify much

DATA: U.S. BUREAU OF LABOR STATISTICS, PROJECTIONS FROM MAY 2014

Extreme Disparities

There are big differences in median wages even within a given state



higher pay. The letter signed by more than 200 economists supporting Sanders's $15 an hour says the federal minimum would be $26 an hour if it had risen with labor productivity since 1968.

But new research by economist Robert Lawrence of Harvard challenges the notion that workers' pay has failed to keep up with gains in productivity—i.e., their output per hour of work. Lawrence says the conventional comparison understates workers' pay and overstates their output—the value of goods or services they create. On the pay side, he includes benefits, and he figures in the pay of all workers, not just production and nonsupervisory ones. On the output side, he subtracts depreciation—the wear and tear on plants and equipment that must be replaced someday—to capture workers' net rather than gross output. And he calculates that the value of goods and services that workers produce hasn't risen as rapidly as the value of goods and services they consume, causing their buying power to stagnate. Lawrence doesn't dispute the growing inequality in pay, but says the $26-an-hour argument "ignores all those other factors that explain that gap."

Some high-profile economists do support $15 an hour. Jared Bernstein, a former chief economic adviser to Vice President Joe Biden, wrote a July 31 blog post noting that employers would have five years to prepare for the new floor in Sanders's bill. Bernstein, a senior fellow at the Center on Budget and Policy Priorities, said whatever job losses there are would be outweighed by pay gains for the majority of low-income people who kept their jobs. "Millions of people rationally support large increases because they expect to gain from them," he wrote. Robert Pollin, the University of Massachusetts Amherst economist who circulated the $15 letter for the Sanders campaign, quickly collected the 200 signatures from friends and followers of the Political Economy Research Institute, the liberal think tank that he co-directs. He says he doesn't know how many of the big names who signed the $10.10 letter might have signed his because he didn't have time to reach out to them.

There's no question among economists that the minimum wage represents a trade-off. On one hand, it does lift incomes. On the other, the higher it is, the more marginal workers will be priced out of the market. Those include teenagers seeking their first paid jobs, the poorly educated or handicapped, and people living in areas with chronically low productivity—perhaps because of inadequate investment in the machinery and software that workers need to boost output.

The question, then, is where is the sweet spot? Katharine Abraham, President Bill Clinton's commissioner of the Bureau of Labor Statistics and later an economic adviser to President Obama, signed the $10.10 letter, but, like Cornell's Ehrenberg, says she would have said no to the $15 letter. "We have no experience with an increase in the national minimum of that size and I am concerned about what a $15 minimum nationwide would do to employment," she wrote in an e-mail.

Both Abraham and Ehrenberg argue that the federal minimum should be on the low side, with cities where productivity and living costs are high setting higher minimums as they see fit. Los Angeles, San Francisco, and Seattle are scheduled to go to $15 an hour in the next several years, while Chicago and Kansas City, Mo., are raising their minimums to $13. In July a New York state board recommended a $15 floor for fast-food chains by the end of 2018 in New York City and July 2021 in the rest of the state. High-wage SeaTac, Wash., raised the local floor to $15 in 2014. That squeezed profits at the upscale Cedarbrook Lodge, which nonetheless went ahead with a 63-room expansion.

A good rule is to set the minimum at half the local median wage, says Arindrajit Dube, a University of Massachusetts at Amherst economist and a leading researcher on minimum wages' impact on jobs. That is "in line ▶

Are Workers Underpaid?

Hourly inflation-adjusted wages of production workers rose only 1 percent from 1970 to 2013, even though gross output per hour of work soared 137 percent. That 136 percentage-point gap seems unfair.

He adjusts pay higher by counting all workers, not just those in production and nonsupervisory jobs, and by taking benefits into account

But Harvard economist Robert Lawrence says the true pay/productivity gap is only

15

percentage points

He adjusts workers' output lower by factoring in losses from wear and tear and notes that what workers produce (such as machines) hasn't grown in value as quickly as what they buy (such as houses)

◀ with the international average and with the U.S. average during the 1960s and 1970s," he wrote in a paper for the Hamilton Project, a policy initiative of the Brookings Institution. The Dube standard would produce minimum wages above $11 an hour today in Alaska and Massachusetts and above $10 in Connecticut and New York, but slightly below the current federal floor of $7.25 in Arkansas and Mississippi–and under $5 in Puerto Rico. —*Peter Coy*

The bottom line Many economists who support a federal minimum wage of $10.10 an hour are uneasy about a minimum of $15.

Human Rights

Islamic State Gets Into the Slave Trade

▶ **The Sunni militants sell captured women and children into bondage**

▶ **"The girls get peddled like barrels of petrol"**

A senior United Nations official says Islamic State is circulating a price list for captured women and children who are being sold as slaves. Zainab Bangura, the United Nations special envoy on sexual violence in conflict, says that on a trip to Iraq in April she was given a copy of an Islamic State pamphlet that included the list. Captured children fetch the highest price. Islamic State fighters seized the captives when they razed the villages of religious minorities as part of their territorial expansion. Those minorities are mostly Arab Christians and Yazidis, who practice a religion based on a mix of Christian, Islamic, and ancient Mesopotamian beliefs. If the women refuse to convert to Islam and marry Islamic State fighters, they're made to serve as concubines and slaves. Non-Muslim men aged 15 to 60 who refuse to convert are shot. Muslim men who resist the group end up in jail. The Islamic State marriage bureau makes the matches between their adherents and converted nonbelievers or noncompliant Muslim women.

The bidders for the nonbelieving women and children, Bangura says, include the group's own fighters and wealthy Middle Easterners. The list's authenticity was established by UN researchers who'd gathered anecdotes on similar slave markets in Islamic State-controlled areas. The UN also relied on its own sources inside Islamic State for corroboration, Bangura says. A video posted on Islamic State's website shows fighters discussing an upcoming slave auction. "The girls get peddled like barrels of petrol," says Bangura, a former foreign minister of Sierra Leone. "One girl can be sold and bought by five or six different men. Sometimes these fighters sell the girls back to their families for thousands of dollars of ransom."

The prices in Iraqi dinars are highest for children age 1 to 9, at $165 for each; adolescent girls go for $124; women older than 20 fetch less. Islamic State commanders first take those they wish, after which rich outsiders from the region are permitted to buy, with the bidding sometimes reaching thousands of dollars. Any slaves remaining are offered to the fighters at the listed prices, Bangura says. The captured boys are trained to become Islamic State soldiers.

In the October 2014 issue of Dabiq, Islamic State's online, English-language monthly, an article on the morality of enslaving women and children concludes that the enslavement of nonbelievers conforms to Islamic law. So is turning the captive women and girls into concubines, according to the article. Dabiq is named after a town in northern Syria where, according to some Islamic writings, a final epic battle between Christians and Muslims will take place. "They have a machinery, they have a program," says Bangura. "They have a manual on how you treat these women." The result is sexual abuse that shows no sign of ending. —*Sangwon Yoon*

The bottom line Islamic State auctions off captured women and children as slaves to terrorize nonbelievers and reward its fighters.

Islamic State's Slave Traffic
Prices of women and children

1-9 years old	$165
10-20	$124
21-30	$82
31-40	$62
41-50	$41

Islamic State men in a video joking about the arrival of slave market day

Bailouts

Can Putin Save Russia's Struggling Companies?

▶ **The government and central bank are spending billions trying**

▶ **"There's no limit to where they're looking now"**

Russian agribusiness group **EkoNiva** recently got a 2 billion ruble ($32 million) loan to expand its dairy operations in the Black Earth region of Voronezh. There's nothing unusual about that, except that the loan came from the Central Bank of Russia, which has set aside 100 billion rubles to help finance industrial and agricultural projects.

Central bankers usually stick to macroeconomic policy and leave business lending to others. But Western sanctions imposed against Russia for its aggression in Ukraine have made it hard for the country's banks and companies to raise money. So over the past few months, Russia's central bank and government have become lenders of last resort. "We need to quickly saturate the economy with long-term, cheap financing," says Andrey Margolin, an economist and vice rector of a state economics academy with

YOUTUBE; ILLUSTRATION BY BRAULIO AMADO

close ties to Vladimir Putin.

The government says it's prepared to spend as much as 60 percent of a $75 billion sovereign wealth fund to help provide financing for companies as well as major industrial and infrastructure projects. It's also pressuring the central bank to expand its project finance program. Separately, the bank has pumped tens of billions into the nation's financial institutions since last year, and has helped state oil giant **Rosneft** raise money to pay $26 billion in foreign currency debt.

Moscow has restricted Western imports in retaliation for the sanctions, and a weaker ruble has made foreign goods more expensive. That should have created opportunities for Russian companies by boosting demand for their products at home. But high domestic interest rates and the lack of access to foreign capital have prevented many from taking advantage of the situation.

> **"The big miss in 2008 was the failure to use the crisis to pursue deep structural reforms."**
> ***—Bernie Sucher, UFG Asset Management***

EkoNiva would have had to pay at least 16 percent interest on a commercial bank loan, vs. the 11.5 percent it got under the central bank program, according to Wolfgang Bläsi, chief financial officer of EkoNiva's German-based parent company. The central bank funnels the aid through a state-owned agricultural bank.

As the central bank poured short-term financing into the banking system, lenders were instructed "to put at least 50 percent into projects the government wanted," says Vyacheslav Smolyaninov, chief equity strategist at BCS Financial Group in Moscow. And the Kremlin drew up a list of 199 "systemically important" companies that will receive priority for aid, including loan guarantees. State-owned energy giants Rosneft and **Gazprom** are on the list, as well as supermarket chains, a fertilizer company, and a consumer electronics retailer.

Including the money in the sovereign wealth funds, the government has $358 billion in foreign currency reserves and gold. So why not put some to work aiding businesses? One problem is that some banks and companies are poorly managed and deserve to go under, according to Bernie Sucher, a longtime U.S. investor in Russia who serves on the board of Moscow-based UFG Asset Management. Bailing them out only delays the day of reckoning, he says. That's what happened in the 2008 financial crisis in Russia, when "the government sprayed liquidity all over the economy," he says. "The big miss in 2008 was the failure to use the crisis to pursue deep structural reforms."

The Kremlin's largesse will only tighten its control over an economy already dominated by large, inefficient state-run companies such as Rosneft—a situation that weighs on the economy. Russia's growth began flagging in 2012, long before last year's decline in oil prices and sanctions pushed the economy into crisis.

The $358 billion stash could be drained pretty quickly. Reserves already are down 30 percent from last year's peak, as the central bank has repeatedly stepped into the currency markets to buy rubles. If crude oil remains close to the current price of about $50 a barrel next year, the Kremlin is likely to deplete a $73 billion sovereign wealth fund it's been using to fill a budget shortfall. In that case it would probably turn to the $75 billion wealth fund—originally intended to buttress the country's pension system—now being tapped for corporate aid, says Dmitry Polevoy, chief Russia economist at ING Bank Eurasia in Moscow.

Promises, Promises

What's been earmarked for some companies

Sukhoi Civil Aircraft
State company's venture with Italy's Alenia Aermacchi
$1.9b
for new Sukhoi Superjet 100 passenger plane

Russian Railways
State railroad group
$3.4b
for locomotives and rail upgrades

Rosatom
State nuclear export monopoly
$2.4b
for construction of nuclear plant in Finland

Novatek
Privately owned energy company hit by Western sanctions
$2.4b
for Yamal liquefied natural gas project in the Arctic

More than $20 billion in that fund has been earmarked for projects, but relatively little has been spent. That's partly because the Kremlin is carefully doling out the money in installments and partly because red tape and bureaucracy have slowed distribution, Polevoy says.

Central Bank Governor Elvira Nabiullina is reluctant to expand the lending program that aided EkoNiva. She said in June that the program hadn't stimulated private investment, as backers had predicted it would. Others, including Dmitry Tulin, a first deputy central bank governor, want to do more. "If our financial system doesn't turn its face toward material production, then our country won't have a future," he told the newspaper *Komsomolskaya Pravda* in April. Meanwhile, the Kremlin is mining new sources of aid. Its latest find: Rusnano, a state investment fund created in 2011 to support an emerging nanotechnology industry. On July 27, Rusnano announced it would put almost $100 million into a new pool for Russian companies that would help reduce the country's dependence on imported technology. Its co-investor: Moscow-based ▶

◀ **SMP Bank**, owned by Putin friends Boris and Arkady Rotenberg. “There’s no limit to where they’re looking now,” a senior government official says. “They’re taking money wherever they can find it.” —*Carol Matlack, with Ilya Arkhipov and Andrey Biryukov*

The bottom line Russia’s central bank and government are spending billions to prop up struggling companies and projects.

Risk

The Shale Patch Faces Reality

▶ Shale producers lack the majors’ ability to remain afloat in an oil glut

▶ “A year ago, you could hedge at $85 to $90, and now it’s in the low $60s”

Not long ago the oil industry looked like it had dodged a bullet. After the worst bust in a generation cut crude prices from $100 a barrel last summer to $43 in March, the oil market rallied. By June, prices were up 40 percent, passing $60 for the first time since December. Oil companies that had cut costs began planning to deploy more rigs and drill more wells. “We didn’t think we’d be quite this good,” Stephen Chazen, chief executive officer of **Occidental Petroleum**, told analysts in May.

The runup was short-lived. Fears over weak demand from China, along with rising production in the U.S., Saudi Arabia, and Iraq pushed prices back below $50. In July, even as the summer driving season boosted U.S. gasoline demand close to record highs, oil posted its biggest monthly drop since October 2008. “The much feared double-dip is here,” Francisco Blanch, head of global commodity research at Bank of America, wrote in a July 28 report.

The largest oil companies are reporting their worst results in years. **ExxonMobil**’s second-quarter net income fell 52 percent; **Chevron**’s fell 90 percent. **ConocoPhillips** lost $180 million. Billions of dollars in capital spending have been cut, and more layoffs are likely. Part of the problem facing the majors is that they’re producing in some of the most expensive places on earth: deep water and the Arctic (page 58).

With their healthy cash reserves the majors can hold out for higher prices, even if they’re years away. The same can’t be said for many of the smaller companies drilling in the U.S. shale patch. Shale producers had bought themselves time by cutting costs, locking in higher prices with oil derivatives, and raising billions from big banks and investors. Many cut drilling costs by as much as 30 percent, fired thousands of workers, and renegotiated contracts with oilfield service companies. “That postponed the day of reckoning,” says Carl Tricoli, co-founder of private equity firm Denham Capital Management.

But it’s not clear what’s left to cut. The futures contracts and other swaps and options they bought last year as insurance against falling prices are beginning to expire. During the first quarter, U.S. producers earned $3.7 billion from these hedges, crucial revenue for companies that often outspend their cash flow. “A year ago, you could hedge at $85 to $90, and now it’s in the low $60s,” says Chris Lang, a senior vice president with Asset Risk Management, a hedging adviser for oil companies. “Next year it’s really going to come to a head.”

Over the first half of 2015, U.S. shale producers were able to raise about $44 billion in debt and equity, according to UBS. As oil prices keep falling, investors are losing their appetite for risky shale debt. Bonds have become more expensive and are laden with more onerous terms, including liens against drillers’ oil and gas assets. More than $24 billion of the $235 billion in debt owed by 62 North American independent oil companies is trading at distressed levels, meaning their yields are more than 10 percentage points above U.S. Treasuries.

“For the weaker companies, it could be very, very painful. Some of them are essentially running on fumes.” —*Jimmy Vallee, Paul Hastings*

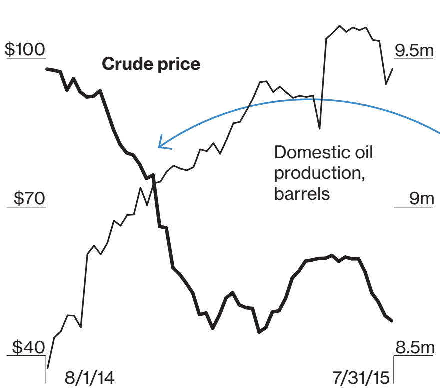
Regulators have warned of the risks of lending to U.S. shale drillers, threatening a cash crunch in an industry that’s more dependent than ever on other people’s money. In October, as they do twice every year, banks will reevaulate drillers’ lines of credit, which are often based on the value of reserves. If prices stay where they are, many companies could be cut off from crucial funding. “For the weaker companies, it could be very, very painful,” says Jimmy Vallee, a partner in the energy mergers and acquisitions practice at law firm Paul Hastings in Houston. “Some of them are essentially running on fumes.”

Over the past year, shale producers have lowered their costs so much that the average break-even price for a barrel of U.S. crude is now in the upper $40s, down from $60, according to research from IHS Energy. That’s allowed them to keep producing, feeding the glut that continues to weigh down prices. At some point, though, they may have to pull back. —*Matthew Philips, Asjylyn Loder, and Bradley Olson*

The bottom line The renewed decline in oil prices has made it hard for shale producers to issue stock or sell bonds.

More Oil for Less Money

Despite falling prices, U.S. crude output has increased



DATA: COMPILED BY BLOOMBERG

Environment

China Gets a Little More Fresh Air

▶ Idled factories, less coal use, lower emissions make breathing easier

▶ “We’re lucky—we have blue sky for these photos”

On a Tuesday afternoon in late July, a newlywed couple prepared to pose for their wedding portraits in front of Beijing’s historic Drum Tower. Lily Chen, 28, in a sparkling white gown and tiara, checked her makeup in a mirror—and then looked up the Air Quality Index (AQI) on her smartphone.

Using data from the U.S. Embassy’s air-pollution monitoring station, a popular website and app display air-quality information in real time. At that moment,

Basking in the sun in a suburb of Beijing

just a few minutes after noon, the level of particulate air pollution was 96 on a scale of 500. That's comparatively tolerable for the capital, where the index exceeded 500, its nominal maximum, during the 2012-13 winter "airpocalypse." "We're lucky—we have blue sky for these photos," Chen says. "Otherwise we'd have to fix the sky with Photoshop."

Beijing has seen more bluish skies this year than in the first half of 2014, according to data from China's Ministry of Environmental Protection and analyzed by Greenpeace East Asia's Beijing office. The 189 cities for which Greenpeace crunched data showed an average drop of 16 percent in levels of PM 2.5—particulate matter less than 2.5 microns in diameter that can lodge in the lungs. Beijing's average PM 2.5 level dropped 15.6 percent, an improvement, though the World Health Organization says its air pollution on most days still greatly exceeds the level deemed safe. The city that reduced PM 2.5 the most—by 42 percent—is Baoji, in Shaanxi province, the heart of coal country.

China's urban air pollution is the result of heavy industry, power plants, and vehicle emissions. Particulate matter is the product of chemical reactions between other pollutants. It's difficult to pin the improved air quality on a single factor, but Greenpeace East Asia energy and climate campaigner Dong Liansai says "one of the most important trends is the reduction in coal burning."

Nationwide, coal consumption dropped 5 percent in four major industries—power, steelmaking, chemicals, and construction—in the first half of 2015 from the same period last year. The economic slowdown likely played a significant role, but it's not the whole story, Dong says. China has increased reliance on energy from non-fossil fuels. Wind, solar, and biofuel accounted for 2.3 percent of the total energy mix in 2014; nuclear made up 0.9 percent; and hydro, 8 percent, according to the United Nations. China's National Energy Plan has set a target of reducing coal's share of energy consumption from 66 percent last year to less than 62 percent by 2020.

In the past year, Beijing has shut down three of its four coal-fired power plants; the last is scheduled to close next year, and natural gas has taken coal's place. The city has restricted the number of new vehicles on the road using a license-plate lottery. Downturns in such energy-intensive industries as steel and glass, concentrated in the nearby areas of Hebei and Tianjin, have also improved regional air quality, says Song Ranping of World Resources Institute in Beijing.

"In the past we've seen the government try to reverse policies when a slowdown occurs," Song says. During the last recession, Beijing's emergency stimulus package allowed unprofitable heavy industries to stay afloat and keep polluting. Now the government appears willing to let some factories fail. Those that stay in business must meet stricter environmental targets, he says.

Not every major city saw improvement. Shanghai's PM 2.5 level rose 1.6 percent from the previous year. Of the 189 cities studied, 10 percent had rising readings of the pollutants.

"China has made big strides in its efforts to reduce the amount of carbon and other pollution that comes from burning coal," says Indiana University economist Anthony Liu, who's tracked the drop in sulfur dioxide and nitrogen dioxide, pollutants almost as toxic as PM 2.5. That's welcome news especially in Beijing, which will host the Winter Olympics in 2022. —*Christina Larson*

The bottom line China's efforts to reduce pollution by cutting coal consumption have produced moderately encouraging results.

Edited by Christopher Power and Dimitra Kessenides
Bloomberg.com

SIM CHI YIN/VII


Morgan Stanley
Capital Creates Hope
A healthier population enriches all our lives. Juno Therapeutics is working to revolutionize how we treat cancer. They turned to Morgan Stanley to help raise the necessary capital. With funding secured through one of the largest biotech IPOs in history, Juno is developing innovative treatments that use the body's own immune system to detect and kill cancer cells. Initial clinical trials have shown encouraging results. Together, we're doing the work to make breakthroughs possible. Capital creates change.
morganstanley.com/juno
The statement, "Initial clinical trials have shown encouraging results," is based on Juno Therapeutics press release dated June 1, 2015.
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August 10 — August 23, 2015

Diebold's New Executive Suite

▶ Top recruits who don't want to relocate to Ohio work remotely

▶ "We broadened the talent pool substantially"

PHOTO ILLUSTRATION BY 731; GETTY IMAGES (3); ISTOCK (2)

Unlike a typical chief executive officer, **Diebold** CEO Andy Mattes can't just stroll down the hall at his company's headquarters in Canton, Ohio, to confer with his top executives over coffee. That's because many don't work there. His chief strategist works and lives 2,100 miles away in San Jose; his chief marketing officer is in Boston. Since taking the helm of the big maker of ATMs two years ago, Mattes has replaced about 60 percent of Diebold's top 100 executives–with two-thirds of them stationed full time far from the head office.

For Mattes, building a virtual management team is crucial to Diebold's turnaround. The company's sales and profits had been declining for several years before his arrival, and his predecessor left after a foreign bribery scandal. To restore credibility and growth, Mattes knew he had to expand Diebold's software and services business so the company could offer banks and other customers more than hardware.

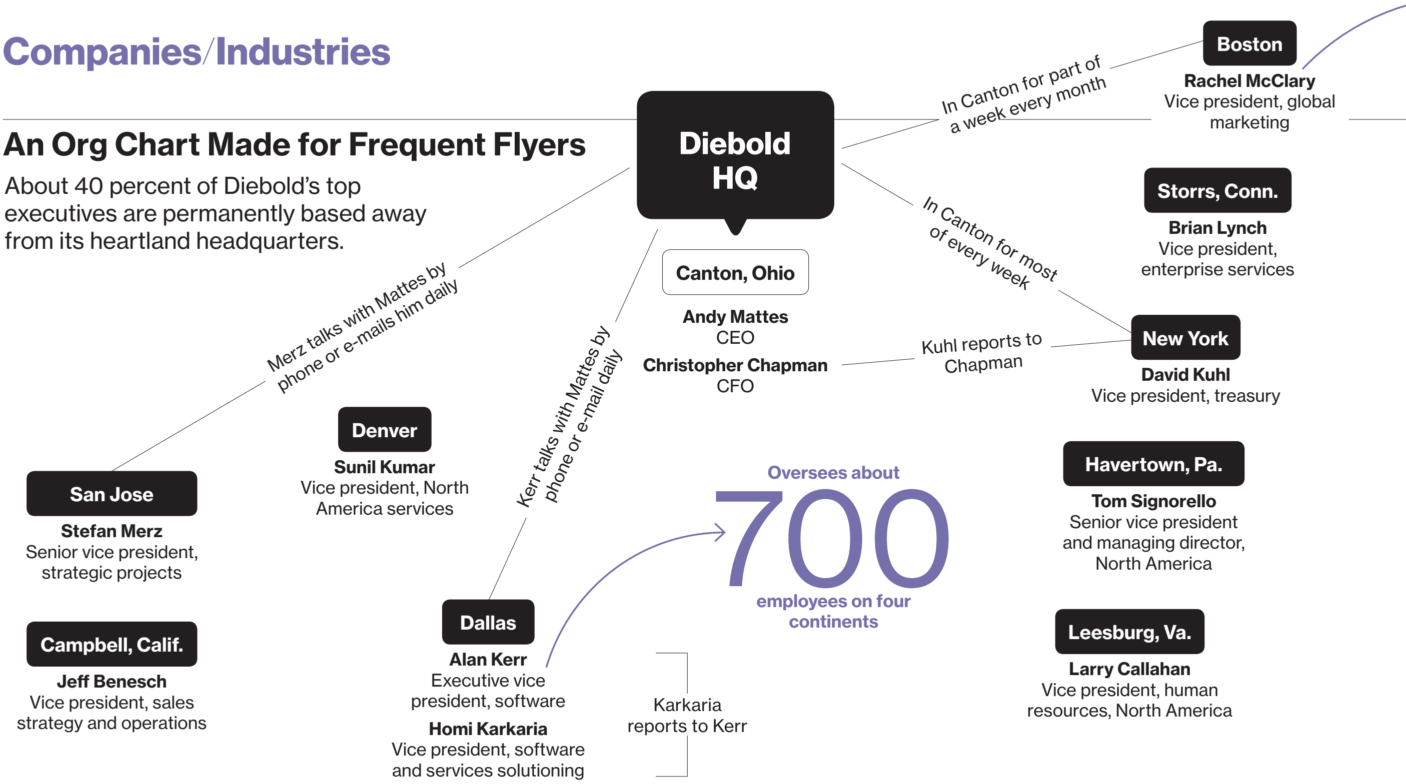
"We needed to change the company's mindset with new people," Mattes says. But with Diebold's headquarters in Canton, he says, "we were fishing in a small pond." The type of software experts he craved don't usually envision themselves relocating to a heartland burg just down the road from Akron, once known as the rubber capital of the world. So Mattes jettisoned the old rule that Diebold executives had to work and live in Canton and lured veterans from "a who's who of the technology industry," he says. "We broadened the talent pool substantially."

As companies move jobs around the globe and videoconferencing and other technology keep dispersed employees connected, managers increasingly are supervising out-of-sight workers. Some 13.4 million Americans, or 9.5 percent of U.S. workers, labored at least one day at home a week in 2010, according to the Census Bureau. And about 40 percent of U.S. professional and management employees work occasionally from their homes, according to 2012 data from the Census Bureau's American Community Survey.

What's different at Diebold is that remote work involves the company's most senior executives, who at many corporations are stationed a few yards from the CEO's office and certainly ▶

An Org Chart Made for Frequent Flyers

About 40 percent of Diebold's top executives are permanently based away from its heartland headquarters.



◀ are not logging in from home. Only 2.4 percent of American workers, excluding the self-employed, report home as their primary place of work, according to 2012 Census survey data, although the numbers have been rapidly rising in recent years, says Stanford economist Nicholas Bloom, who's studied virtual management.

The practice poses particular challenges for corporations with collaborative cultures. Far-flung executives can't pop into one another's offices for impromptu meetings, or have meandering conversations over lunch that can lead to new ideas, or get to know a broad group of employees outside their departments. Scheduling phone meetings across time zones can trigger conflicts over whose sleep gets interrupted. And it may be hard on the phone to consider complex problems or pick up social cues, which can lead to misunderstandings.

Such concerns were one reason **Yahoo!** CEO Marissa Mayer in 2013 declared an end to her employees working from home, citing the need to benefit from "decisions and insights [that] come from hallway and cafeteria discussions." Others including **Best Buy** followed suit.

Some experts agree with Mayer's concerns. "A remote team may never jell, and it's hard to build a culture," says Peter Crist, chairman of executive recruiter Crist|Kolder Associates. His corporate clients typically rule out C-suite-level candidates who won't move to headquarters. But some companies may have little choice. "If you aren't in a mainstream city—especially today when good candidates are getting inundated with recruiter calls—you may have to be creative. Not forcing relocation may help a company like Diebold."

Mattes, who managed some staff from a distance in his prior jobs at Hewlett-Packard and Siemens, says it requires trust and discipline. Every Monday morning he has a teleconference with about a dozen executives to "sync up for the week," he says. To compensate for restricted face time, he talks daily by phone with several of his direct reports and sees them in person at least every few weeks—sometimes when they're visiting headquarters or while they're traveling and cross paths.

Most Diebold executives who work remotely spend at least a few days a month in Canton. Many whom Mattes recruited were his employees or colleagues at HP or Siemens, so he's familiar with their capabilities and working styles. "As long as they live near an airport," he says, "where they work isn't nearly as important as what they can contribute."

"If you aren't in a mainstream city—especially today when good candidates are getting inundated with recruiter calls—you may have to be creative"

Mattes needs all the savvy help he can get. Diebold is the largest manufacturer of ATMs in North America, but in key international markets it lags behind rival **NCR** and global competitors such as Germany's **Wincor Nixdorf**. With about 75 percent of its sales from ATMs, Diebold also is far more dependent on that business than NCR (which also makes self-checkout kiosks for retailers) at a time when the number of bank branches in the U.S. is shrinking.

Many of Diebold's new recruits wouldn't be in Canton a lot even if they'd moved there, because they spend the bulk of their time traveling to meet with their own scattered staffs and customers. Diebold's new head of software, Alan Kerr, who works from his home office in Dallas, never considered relocating because of his wife's career, "and Andy never brought it up," he says. He travels almost 80 percent of the time, visiting the 700 employees he supervises on four continents.

Kerr's calendar during the week of July 23 was fairly typical. First he flew to London, Ontario, where he oversees Diebold's newly acquired Phoenix software business. (Phoenix's products link ATMs made by different companies, a feature many of Diebold's financial-services customers want.) Then he traveled to Latin America to meet a new customer before heading to Europe for more meetings.

Kerr tells out-of-sight employees to text him instead of sending long e-mails

Communicates with her global staff by e-mail and videoconference

and then tries to quickly connect by phone if they want to converse. "Having a focused phone call isn't very different than walking into someone's office to talk," he says.

Diebold's new head of marketing, Rachel McClary, works from her home office in Boston but is in Canton at least part of one week each month. She also travels every month to other cities, including Atlanta and Charlotte, where she has staff. A veteran virtual manager who, like Kerr, worked for Mattes at HP, she didn't want to uproot her school-age children or leave Boston, where she grew up.

Besides, she thinks the flexibility she gets working from home helps her productivity. "I save time commuting, and sometimes there's a benefit to taking a call in your PJs," McClary says. One downside is never getting away from work. "If I leave my laptop near the kitchen, I keep working when I'm cooking dinner or cleaning up." *—Carol Hymowitz*

The bottom line Although just 2.4 percent of employees in the U.S. work remotely full time, many of Diebold's senior executives do.

Supermarkets

Aldi Tries High-End Food and Discounts, Too

▶ The bare-bones retailer is adding higher-end foods to woo shoppers

▶ "People ... realized that it was good quality food and great value"

Aldi became one of the world's biggest food retailers using a simple formula of no-frills stores offering a small assortment of products at rock-bottom prices. After decades of expansion in Europe, it followed the same strategy in the U.S., where it gets about $8 billion in annual sales and is growing from 15 percent to 20 percent a year, estimates Jim Hertel, managing partner at food-retail consultant Willard Bishop. Now the low-end discounter is working to also make itself more attractive to a different consumer: the type that shops at **Trader Joe's**.

Both supermarket chains are controlled by different factions of Germany's billionaire Albrecht clan, but there's more than just a family rivalry at play. Aldi U.S. Chief Executive Officer Jason Hart has seen American shoppers become more concerned about the content and quality of the foods they eat. So his chain recently added organic quinoa and coconut oil, chia seeds, and grass-fed beef. It's also testing cage-free eggs and sriracha sauce to pull Americans from not only traditional supermarkets, but also specialty chains. Aldi's own SimplyNature all-natural and organic line has become its fastest-growing brand. Says Hart: "This isn't your grandmother's Aldi.... We're attracting more consumers."

The grocer, with 1,400 U.S. locations, is set to compete fork-to-fork against established West Coast foodie favorites such as Trader Joe's and **Sprouts Farmers Market**. Next year, Aldi will enter California, and it plans to reach 2,000 locations nationwide by the end of 2018.

Aldi's reputation as a low-end retailer has changed since the recession, says Hertel. "People got forced into it and realized that it was good quality food and great value," he says. "The perception started to change."

The secretive company was founded more than a century ago when Anna Albrecht opened a small store in Essen, Germany. In 1948 her sons, Karl and Theo, took over and expanded to 30 locations in seven years. The name was shortened from Albrecht Discount to Aldi in 1962, the year the Albrecht brothers split the chain into separate companies—Aldi Süd and Aldi Nord—following a feud over whether to sell cigarettes.

Closely held Trader Joe's is owned by **TACT Holding** of Monrovia, Calif., which is held in a trust by the Albrecht family branch that owns Aldi Nord. Aldi Süd oversees Aldi's U.S. locations and those in the U.K. and Australia. Globally, there are about 9,950 Aldi stores.

Aldi made its U.S. debut in 1976 in southeastern Iowa with just 500 items (it has about 1,300 core ones now). In 1998 it had 500 stores in the U.S. and a decade later expanded beyond the Midwest to Florida and Connecticut. Hart, who took over as CEO in April, plans to have 45 stores in Southern California by the end of 2016.

Americans, who spent about $33 billion on organic goods last year, according to the *Nutrition Business Journal*, increasingly expect to find them at both traditional supermarkets and discounters such as Aldi. The store plans to give them such goods but at the extreme discounts it's known for. In Chicago, it sells a regular can of tomato sauce for 25¢, while bananas are 38¢ a pound. Hart says Aldi's prices are as much as 40 percent below that of traditional grocery stores and 25 percent less than big-box discounters such as **Wal-Mart Stores**.

A July grocery price survey by Bloomberg Intelligence found Aldi to be cheaper than other discounters including Wal-Mart and **SuperValu**'s Save-A-Lot chain. A basket of 78 private-label items, including cereal and sour cream, was $121.59 at Aldi, compared with $149.58 at Wal-Mart and $133.66 at Save-A-Lot.

Show Me The Discounts

Cost of 78 items, July 2015

Aldi	**$121.59**
Save-A-Lot	**$133.66**
Wal-Mart	**$149.58**
Wegmans	**$156.64**
Acme	**$181.35**

The chain, which Hart says primarily targets 25- to 45-year-old moms plus anyone looking for a deal, keeps its costs low. Aldi stores are small, averaging just 10,000 square feet of retail space—about a third the size of a Walmart Neighborhood Market small-format grocery. Multiple and large barcodes are emblazoned across most items at Aldi, making checkout faster for cashiers. As few as four employees can run a store, and customers bag their own groceries—with the store charging from 4¢ each for a paper bag to $1.99 for a reusable eco sack if they don't bring their own.

Although Aldi is based in Germany, it's seeing most of its expansion in other areas as consumers worldwide look for low prices in smaller, easy-to-shop stores. Its "growth really comes from the U.S. and also from the U.K. and Australia," says Denise Klug, an analyst at Planet Retail in Frankfurt. "In European markets and in some industrialized nations, big boxes in general are losing their importance."

Discount grocery competition is about to increase in the U.S. as Germany's **Schwarz Group** moves toward the American debut of its bare-bones Lidl chain before the end of 2018. Lidl, which copied Aldi's limited-assortment/low-price format in the 1960s and is expanding quickly now, is Aldi's biggest competitor globally, ▶

ILLUSTRATION BY 731

◀ Klug says. Lidl's been more willing than Aldi to try new things, she says, and may be able to lure shoppers with fresh fish, upscale wine, and in-store bakeries. "It will be very adventurous for them to go into the U.S.," Klug says. "This might also be the reason why Aldi is really accelerating their expansion." —*Leslie Patton*

The bottom line Discount supermarket Aldi, which logs an estimated $8 billion annually in U.S. sales, will add 600 stores by 2019.

Media

This Music Label Wants To Be a Movie Mogul

▶ Universal Music bets films will boost sales of its artists' songs

▶ Biopics "open a whole new world of opportunity for our artists"

Amy Winehouse's nine-year-old album *Back to Black* in recent weeks outsold newer records from bigger stars including Beyoncé, Adele, and Pitbull. One reason: critical praise for a documentary about the singer's sudden rise and alcohol-fueled fall. The film, *Amy*, has grossed more than $11 million worldwide since its July 3 release, according to Box Office Mojo.

What distinguishes *Amy* from other music documentaries is that it was produced and financed by **Universal Music Group** as part of a push into movies. Chief Executive Officer Lucian Grainge wants the world's biggest label to gain a greater share of what fans spend on its artists. The company also recently financed *Cobain: Montage of Heck*, a documentary about Nirvana frontman Kurt Cobain.

"Increasing our presence in film, television, and short-form video is critical to our strategy," Grainge wrote in an e-mail. "These projects can open a whole new world of opportunities for our artists and underscore their massive appeal beyond recorded music. The success of *Amy* is but one example of this, and there will be many more to come."

At a time of shrinking music sales, movies introduce older artists to a new generation and remind long-term fans of songs they've always loved. The exposure also enhances the long-term value of an artist's catalog.

Winehouse's *Back to Black* returned to the *Billboard* 200 chart after *Amy* opened on July 3. Nirvana's music saw a boost in April when *Cobain* played theaters and began airing on HBO, as did the Beach Boys' songs after the Brian Wilson film *Love & Mercy* opened in June. Universal Music owns the Beach Boys' music and is distributing the film's soundtrack. *The Best of N.W.A.*, a compilation by the iconic late-1980s rap group, has returned to the *Billboard* charts in anticipation of the Aug. 14 release of the film *Straight Outta Compton*. Former N.W.A. member Dr. Dre, who later founded a record label within Universal, has also produced a soundtrack for the biopic.

Universal Music, which was part of the same conglomerate as Universal Pictures and is now owned by Paris-based **Vivendi**, is mining an extensive roster of artists and hit songs to make extra cash from ticket sales and home-video rights. The success of biopics about Johnny Cash and Ray Charles, which each grossed more than $120 million in theaters, highlights the potential.

Universal Music's Republic Records, which distributes Taylor Swift's albums, said in March it would produce and finance several music-oriented films with distributor **IM Global**. The first is *Rollin' Thunder*, about a bowling champion, inspired by an idea from Nelly, one of Republic's artists. "Every artist walks in with a demo and a script," says Monte Lipton, Republic's CEO. "Now we have a vehicle where we can do this."

Music sales have fallen by almost two-thirds since the mid-1990s, according to the International Federation of the Phonographic Industry, which put 2014 revenue at $15 billion. Online piracy and new technologies such as YouTube have led many consumers to expect to enjoy music for free. New businesses, such as streaming, haven't replaced the lost revenue. Universal Music says it released seven of the top 10 albums of 2014, including Swift's *1989*, Sam Smith's *In the Lonely Hour*, and the soundtrack to *Frozen*, yet still suffered a 6.7 percent drop in sales.

In addition to *Amy* and *Cobain*, Universal Music is producing a Beatles documentary that will be released next year. (It owns the group's masters.) In 2014 the company acquired film producer Eagle Rock Entertainment so it could do more in-house filmmaking. Eagle Rock owns a library of more than 800 titles and has produced concert films with the Rolling Stones, the Who, and Queen.

Universal Music is moving into the documentary business just as the format is benefiting from the interest of video services such as **Netflix**, which just released a documentary about singer Nina Simone and will offer one about Rolling Stones guitarist Keith Richards in September.

"There is an awful lot of energy and money put into building these brands in the past," says Charlotte Walls, CEO of **Catalyst Global Media**, an entertainment finance company, which on Aug. 6 announced a deal to produce films with **Warner Music Group**. "Film documentaries allow music labels and estates to be rewarded for that investment beyond the artist's life." —*Lucas Shaw and Anousha Sakoui*

The bottom line Record sales have fallen two-thirds in 20 years. Universal Music is lessening the pain by making movies featuring its artists.

51

Billboard 200 rank of Amy Winehouse's 2006 album *Back to Black* for the week of Aug. 1, a month after her documentary's debut

Sports

Young Guns Help Shooting Sports Grow

▶ High schools embrace trapshooting across the Midwest

▶ "To see your kid this happy is incredible"

A group of giddy 13-year-old boys ooh and aah as they stare down black shotgun barrels and aim at clay targets they imagine whizzing through the air. It's mid-June in Alexandria, Minn., 130 miles northwest of Minneapolis, and the teens are competing in the annual Minnesota State High School Clay Target League championship.

"You guys are welcome to test any of these out," says Dusty Minke, a salesman for firearms maker **Browning**, as

In Minnesota, trapshooting is the fastest-growing high school sport

BRIDGET BENNETT/BLOOMBERG

he mans its kiosk. The company is one of several gunmakers backing the event. “We’ve actually had a couple of kids who did so good on the test range that they were, like, ‘Can I use this for my rounds?’ ” Minke says. “We let ’em, and their scores went up—and they’ll hopefully go and buy one.”

Trapshooting is Minnesota’s fastest-growing high school sport, and its popularity is spreading across the Midwest. That’s made the event the world’s largest shooting competition and a can’t-miss opportunity for companies such as Browning, **SKB Shotguns**, and outdoor-goods retailer **Cabela’s** to cultivate the next generation of prospective gun buyers.

The National Shooting Sports Foundation estimates the average consumer who takes up trapshooting at age 16 will spend $75,000 on the sport over his lifetime. That’s an enticing number for gunmakers and retailers, which have seen sales level off after a spike following the 2012 elementary school massacre in Newtown, Conn.

Browning, Cabela’s, and Italian firearms producer **Benelli Armi** each spent $7,000 for platinum sponsorship of this year’s championship, which has grown from 30 competitors in its first year, 2009, to more than 5,000 shooters and more than 20,000 spectators today.

The sport’s growth in recent years is thanks in large part to support from these and other companies. They also donate equipment to school teams, and some offer discounts to team members. And they’ve started tailoring products for smaller bodies and budgets, such as **Winchester Repeating Arms**’ SXP Trap 12-gauge shotgun, retailing at $480.

The shooting competition is organized by the USA State High School Clay Target League outside Minneapolis, which was started in 2001 by retired advertising executive and trap enthusiast Jim Sable. Participation in the league has exploded from 340 students five years ago to 9,245 students in the just-ended school year, at schools in Minnesota, Wisconsin, and North Dakota. Schools in Arizona, South Dakota, Illinois, and Kansas will host teams next year.

Sable estimates spending by the league’s more than 295 teams will top $5 million this year. Trapshooting is so popular in Minnesota that the legislature appropriated $2 million for the expansion of gun ranges, where students compete. (Competitions aren’t allowed on school grounds.)

$75k

Potential lifetime spending of a 16-year-old who takes up trapshooting

The league’s success is a “bright spot” for the outdoor-recreation industry, says Tommy Millner, chief executive officer of Cabela’s, a hunting, fishing, and camping gear retailer with 71 stores across North America. “This is such a positive way for young people to get involved in shooting sports,” he says.

Zac Olson, 15, helped lead his high school’s squad to victory in June. “You don’t have to be superfast or superstrong,” he says. His mother, Courtney Olson, was repulsed by the idea of guns in her home when he took up the sport two years ago. She’s come around and bought Zac a $1,400 SKB Century III 12-gauge shotgun for trap and a $600 Glock 17 to nurture his interest in becoming a police officer. “To see your kid this happy is incredible,” she says.

For the National Rifle Association, which lobbies against firearm restrictions, young shooters are an important new constituency. “These kids are going to be future legislators, and they’re going to get in there and know the truth about weapons,” says NRA member Dennis Taylor, an operations manager at the Wisconsin Trapshooting Association. The NRA’s philanthropic arm funds individual teams.

Gun-control advocates don’t object to trap as a school sport, but they disagree with its supporters’ position that the sport leads to fewer gun accidents because it teaches children how to safely handle weapons. They cite data showing gun-owning households are at higher risk of homicide and suicide by firearm.

For Stephanie Petsilis, a 17-year-old who shoots for Wayzata High School outside Minneapolis with a $1,430 Browning BT-99 Micro, trap is “just like any other sport. It’s just cool because I get to use a gun.” The avid deer hunter says she hopes to shoot trap till she’s 90. The gun industry hopes so, too. *—Esmé Deprez*

The bottom line Minnesota’s high school trapshooting championship drew about 5,000 contestants this year, up from 30 in 2009.

Edited by James E. Ellis and Dimitra Kessenides
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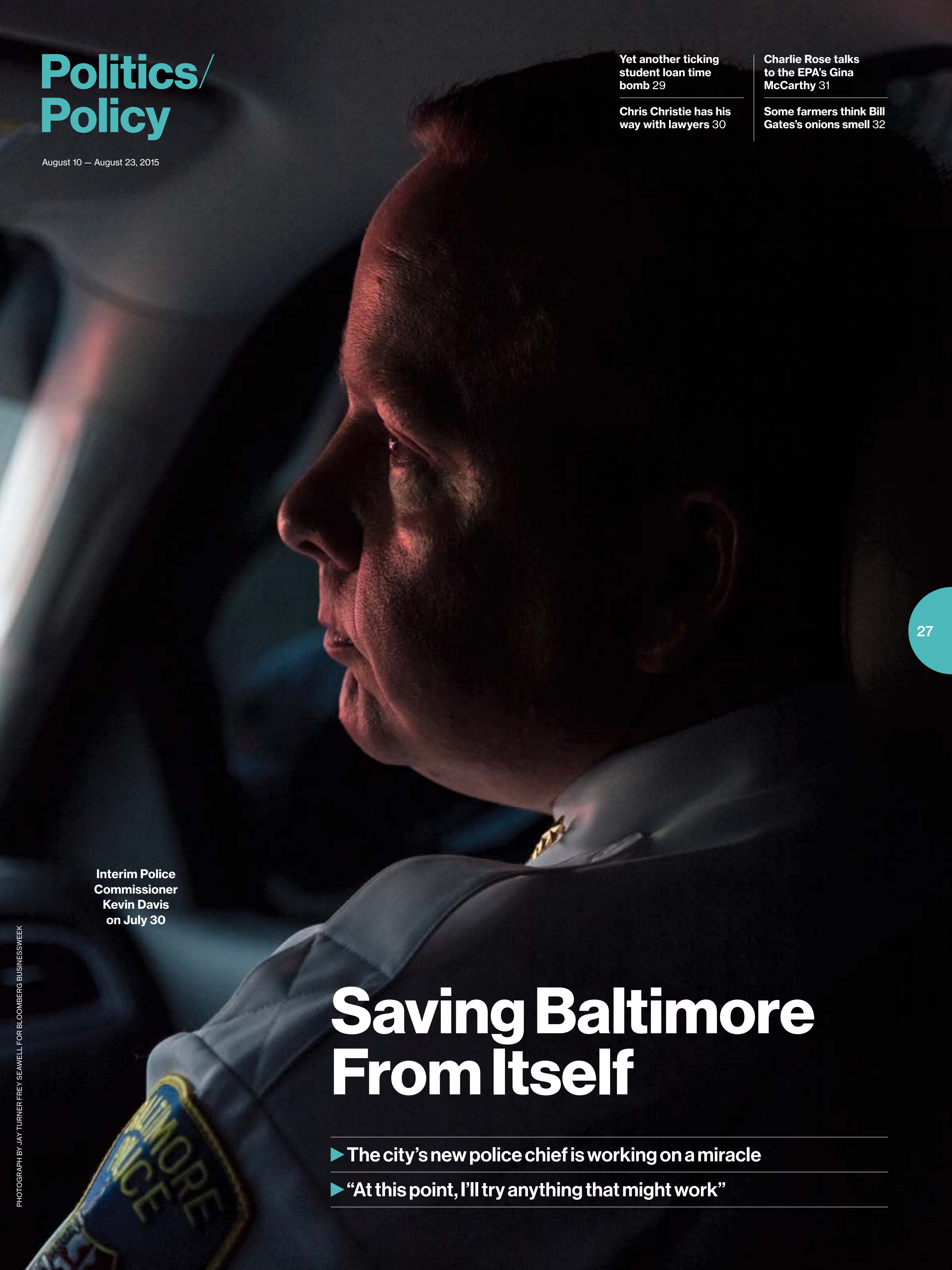


Interim Police Commissioner Kevin Davis on July 30

PHOTOGRAPH BY JAY TURNER FREY SEAWELL FOR BLOOMBERG BUSINESSWEEK

Saving Baltimore From Itself

▶ The city's new police chief is working on a miracle

▶ "At this point, I'll try anything that might work"

It's 8:45 a.m. on an already steamy July Monday. Kevin Davis, Baltimore's interim police commissioner, is sitting alone at his desk, studying the daily crime report. The numbers are grim: In the less than two weeks since he took over as the city's top cop, 15 people have been killed. By the end of July, the total would be 45—tying the city's record for a single month. That follows 41 homicides in May and 29 in June, a murder rate that rivals that of the bloody 1990s. His job right now is to reverse the trend. The trick will be to aggressively crack down on crime while repairing the broken relationship between his force and the community it's supposed to protect. "This is like building an airplane in midflight," Davis says, placing the packet of crime statistics back on his desk, rubbing his ruddy cheeks, and staring out his fifth-floor window.

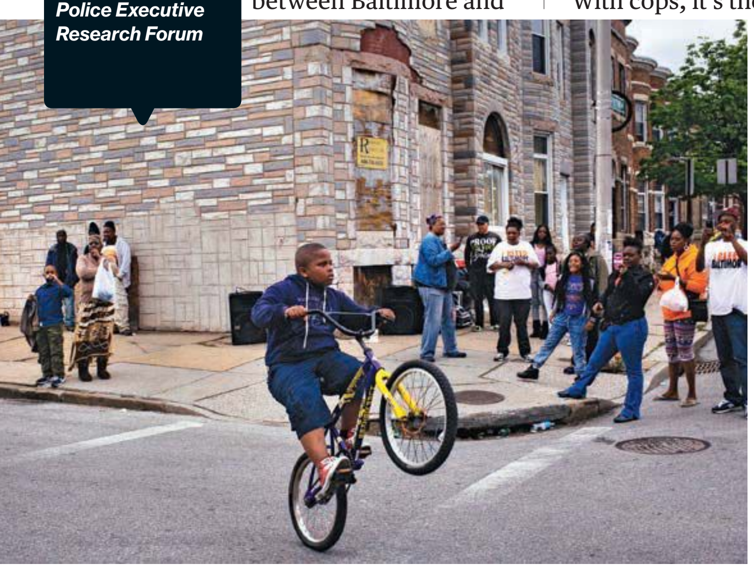
In late April the city erupted after the death of Freddie Gray, a 25-year-old African American who suffered severe spinal injuries while in police custody. More than 280 businesses were destroyed or damaged in a week of rioting, according to federal estimates. Baltimore is preparing for another possible round of unrest this fall, when the six police officers charged in connection with Gray's death are scheduled to go on trial. "The city is at a critical point," says City Council President Bernard "Jack" Young. "If we don't do this thing just right, we can have mayhem in this city."

"It's a big city, and it's got all of the issues. It has a community that is on edge. It's got a police force on edge."
—*Chuck Wexler, Police Executive Research Forum*

Davis, a white 46-year-old who built his career in the Maryland suburbs between Baltimore and Washington, is enjoying a honeymoon period. He replaced Anthony Batts, an experienced black police leader who spent most of his career in California. Batts arrived in Baltimore, where 63 percent of the 622,000 residents are black, in 2012. By last year, Baltimore's homicide rate had dropped dramatically: Only 211 people were slain in 2014, the second-lowest total since the 1980s.

Then came the riots and their aftermath. Theories abound as to what triggered the crime wave: pent-up anger uncorked by Gray's death following a year of public outcry over similar episodes across the country, starting in Ferguson, Mo.; a slowdown in enforcement by demoralized cops; a power vacuum created by the recent indictment of major gang leaders; a flood of lucrative prescription drugs stolen from local pharmacies washing through the market. On July 8, Batts was unceremoniously dismissed by Mayor Stephanie Rawlings-Blake, who said publicly that political infighting over his performance was interfering with efforts to address the violence.

He was replaced that day by Davis, who'd joined the department—the nation's eighth-largest—only in January as head of its investigative units. One of his first executive orders: rescinding a rule that prevented officers with tattoos on their arms from wearing short-sleeve uniforms, even in the heat of summer. It was a minor gesture but one he hopes sent the message that he wants to make it easier for officers to do their jobs well. "I need these guys to get into the crime fight," Davis says. "With cops, it's the little things."



He's moved quickly to address complaints, fixing ineffective work schedules, revamping the department's organizational chart, promoting nearly 20 commanders to fill open slots, and temporarily putting dozens of administrative officers back on the streets. He's created a war room to help analysts, detectives, and prosecutors share information about the most murderous gang leaders, with the goal of getting them behind bars.

One of Davis's most pressing concerns is making sure his officers get training in handling mass disturbances. At a weekly meeting of his top staff, a commander reports that slightly more than 700 of Baltimore's 2,800 officers have been through the refresher course—but he assures Davis that everyone will go through it before September, when hearings are scheduled for the officers in the Gray case.

The commanders tell Davis they need new equipment. The wish list includes in-car and body cameras, a rescue truck, laptop computers, and license-tag readers. Davis says they need to come up with a catalog the city can present to the U.S. Department of Justice, which is conducting a wide-ranging civil rights probe into his force. While some chiefs might resent the federal interference, Davis welcomes it. Having worked through a similar probe during his time at the department in Maryland's Prince George's County, east of Washington, Davis believes the DOJ investigation will provide the political catalyst he needs to remake his force. He's establishing a team whose only job is to interact with federal investigators to speed implementation of changes as quickly as possible. "This will help us in the long run," he says. "It's also hard to say no to a federal judge."

Chiefs in other cities battling serious crime problems and seeking to repair strained relations with minority residents are watching Davis, says Chuck Wexler, executive director of the Police Executive Research Forum, a nonprofit specializing in management studies of law enforcement. The group was hired by the Baltimore Police Department to conduct a review of its response to the April riots. "It's a big city, and it's got all of the issues," Wexler says. "It has a community that is on edge. It's got a police force on edge. It has a high crime rate. It's the middle of the summer, and the trial of the officers is coming up. There is a lot hanging in the balance, and there is no question that major city chiefs are looking to Baltimore, and they are thinking, 'There but for the grace of God go I.' "

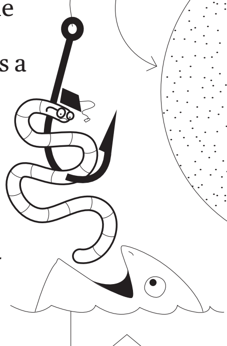
After finishing his staff meeting, Davis heads back to his office and starts returning calls. The commissioner has passed out his cell number to everyone from neighborhood association presidents to the sister of a man who died in police

NATALIE KEYSSAR; ILLUSTRATION BY: 731

custody. He's visited a Jewish day camp, sat with the parents of homicide victims, and solicited the help of current and former gang members. "At this point, I'll try anything that might work," he says. In each encounter, he asks for help. He often gets requests in return—none are too small for his attention. When a community leader complains about drug dealers on a busy street corner, he detours to the spot and personally shoos away two before texting a commander to get officers into the area.

He also takes the time to visit station houses for roll call. "I need warriors and community ambassadors," he tells 18 members of the Northwestern District before they hit the streets one afternoon, explaining that they will interact with many more people than he ever can. To gauge their community-building skills, he poses a question: How many times do they say hello to residents on any given 10-hour shift? An officer finally replies that he says hello to maybe five people during a normal patrol. Davis shakes his head and bites his lip, trying to contain his frustration. He doesn't want to embarrass the officers; they seem earnest and dedicated, and he desperately needs them on his side. But five hellos isn't enough. Not nearly. "It starts with hello," he says. "It starts with you." —*Del Quentin Wilber*

The bottom line Baltimore's new police chief is reaching out to the community and the force to stop a crime wave.



Education

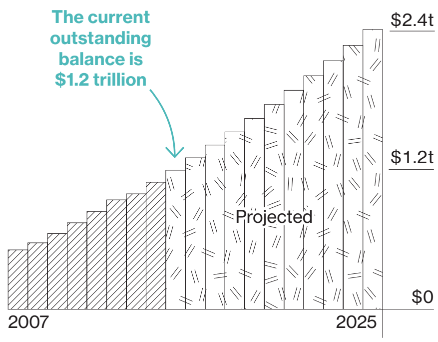
Asking Everyone's Rich Uncle to Pay for School

▶ **A federal program offers breaks on student loans at taxpayer expense**

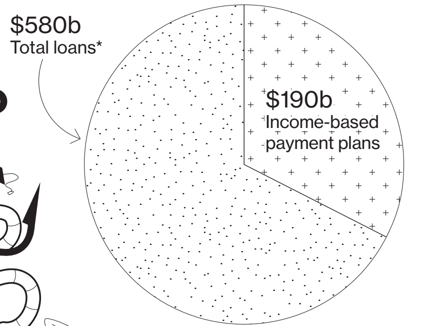
▶ **"In a time of scarce resources, is it better to spend money that way?"**

Laura Strong, a 29-year-old in suburban Chicago, owes $245,000 on student loans for the psychology Ph.D. she finished in 2013. This year, she says she hopes to earn $35,000 working part-time jobs as a therapist and yoga teacher—not enough to manage a loan payment of about $2,000 a month. But Strong isn't paying anything close to that. She's one

Federally Backed Student Loans



Loans Owned by the Government



*DOESN'T INCLUDE LOANS NOT YET BEING REPAID OR IN DEFAULT. DATA: CONGRESSIONAL BUDGET OFFICE, DEPARTMENT OF EDUCATION

of at least 3.8 million Americans who've qualified for federal programs that tie payments to income and eventually forgive debt for some struggling borrowers, leaving taxpayers to pick up the tab.

President Obama has praised the programs for offering a lifeline to borrowers who'd otherwise default, scarring their credit. Strong pays about $100 a month on her federal loans, which she used to finance her graduate studies at **Argosy University**, a for-profit institution. "I wouldn't know how I would pay it back otherwise," she says.

Income-based repayment was introduced under President Clinton, but the programs weren't heavily promoted until late 2013, when the Obama administration began sending e-mails to borrowers, including Strong, telling them, "Your initial payment could be as low as $0 a month." The number of people using these plans has quadrupled since 2012. About half of borrowers taking out the Department of Education's Grad Plus loans, which finance advanced-degree studies, are in income-driven plans. Most borrowers in the programs have payments capped at 15 percent of income, with allowances for housing and other expenses. In December the Obama administration is expected to expand the number of borrowers eligible for a payment cap of 10 percent. In a July 27 speech at the University of Maryland's Baltimore campus, Secretary of Education Arne Duncan said the plans protect people going into socially valuable but low-paying lines of work from crushing debt. "That's good for them. That's good for our economy. It's good for our society," he said.

Critics say the plans are a hidden subsidy to well-off students and colleges, which can justify tuition increases by reassuring students that they may not have to repay their debt. In a seminar at Georgetown Law, Charles Pruett, assistant dean for financial aid, was captured on video telling alumni they could "ignore" debt balances if they spent 10 years in government or nonprofit jobs, which would qualify them for early loan forgiveness. (The video was first reported in 2013 by the New America Foundation, a Washington think tank.) Pruett says Georgetown promotes the programs to encourage graduates to take public-service jobs. "It's an earned benefit, not a giveaway," he says.

Borrowers hold $1.2 trillion in federal student loans, the second-biggest category of consumer debt, after mortgages. Of that, more than $200 billion is in plans with an income-based repayment option, according to the Department of Education and Moody's Investors Service; of those loans, $190 billion were originated by the department after 2010 or bought by the government during the financial crisis. Both Moody's and Fitch Ratings are considering cutting ratings for securities tied to those loans—an extraordinary development, since the government guarantees the debt. For taxpayers the loans are "a slow-ticking time bomb," says Stephen Stanley, a former Federal Reserve economist who's now chief economist at Amherst Pierpont Securities in Stamford, Conn.

The Congressional Budget Office estimates that, for loans originated in 2015 or after, the programs will cost the government an additional $39 billion over the next decade. That's more than the agency spends each year on Pell grants, the public scholarship program for low-income students. "In a time of scarce resources, is it better to spend money in that way or raise the Pell grant?" asks Margaret Spellings, who served as education secretary under George W. Bush.

The U.S. Government ▶

◀ Accountability Office is opening a review of the cost of the plans following a June 19 request filed by Mike Enzi, the Wyoming Republican who chairs the Senate Budget Committee. According to spokesman Joe Brenckle, Enzi is concerned about the "fiscal uncertainty" surrounding the long-term costs of the income-based repayment plans.

Some graduates would prefer tuition cuts over loan breaks. In 2009, Kyle McEntee, a 2011 graduate of Vanderbilt Law School, co-founded a nonprofit called Law School Transparency to advocate for reducing the costs of legal education. "It doesn't seem like a great idea to have a legal education set up where forgiveness from the federal government is the only way you can afford to go to law school," he says. McEntee speaks from experience. He's enrolled in the public-service forgiveness plan. His monthly payment: zero. —*Janet Lorin*

The bottom line A federal program to help student borrowers get out from under debt may cost taxpayers billions.

Local Government

Christie's Control Over Port Authority Contracts

▶ **The New Jersey governor picked the law firms that got agency work**

▶ **"It's consistent with [his] pattern of looking for ways to reward allies"**

One World Trade Center was finally rising over downtown Manhattan, after years of battles about its design, security, and cost, when a new problem emerged: The site's political overseers wanted to oust the project's lead law firm.

It was early 2010, and Chris Christie had just been sworn in as governor of New Jersey. His appointees to the Port Authority of New York and New Jersey were pressing to have DLA Piper fired. The reason: A powerful Republican at the firm had refused to endorse Christie in the election, according to interviews with current and former executives at the agency. Port Authority officials resisted, concerned that switching lawyers would throw construction further behind schedule. Still, DLA's billings from the WTC project dropped as it was passed over for new work.

Christie, who's now running for

Under the Influence

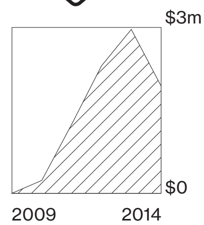
Three firms doing legal work for the Port Authority saw their fortunes change under Christie

GOP Heavyweights

Annual billing*

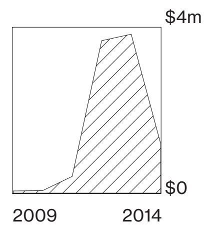
Craig Domalewski
Senior partner, Dughi, Hewit & Domalewski

Served as special counsel for Christie's 2013 reelection campaign



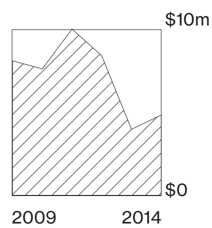
Bill Palatucci
Special counsel, Gibbons

A Christie confidant who joined the firm in 2012



William Gormley
Partner, DLA Piper

A Republican state senator for more than two decades



*FIRMS' REVENUE FROM PORT AUTHORITY CONTRACTS; DATA: PORT AUTHORITY OF NEW YORK AND NEW JERSEY

president, made the call himself about which firms got work from the PA—and which didn't—say two people involved in the process. Jameson Doig, a retired Princeton professor who has authored a history of the agency, says of the claims: "It's consistent with Chris Christie's pattern of looking for ways to reward allies and punish those who don't agree with him."

Previously undisclosed details about the Christie administration's steering of PA legal contracts were gleaned from thousands of pages of billing records, memos, and e-mails. Current and former PA officials who played a role in awarding the contracts were interviewed, as were people involved in a federal investigation of the Christie administration's role in the September 2013 closure of lanes leading to the George Washington Bridge, which is run by the PA. Most of the people interviewed requested anonymity, because they weren't authorized to discuss the contracts. Christie spokesman Kevin Roberts said in a statement: "The Governor has no role in and has never directed the Port Authority's selection of any legal or professional services contract, period. Citing unsubstantiated anecdotes from anonymous sources to suggest so is not only irresponsible, it's completely false."

As the U.S. attorney for New Jersey from 2002 to 2008, Christie awarded friends and allies no-bid legal contracts worth millions of dollars to monitor companies that avoided prosecution by paying penalties and promising to reform. Still, the more than 100 public corruption cases he prosecuted during that tenure cemented Christie's reputation as a reformer, helping him become the first Republican to win a statewide race in New Jersey in more than a decade.

The PA, which operates bridges and transportation hubs in metropolitan New York, has a long history of patronage hires and meddling by the governors of New York and New Jersey. Former PA officials say that within months of Christie's inauguration, his allies came to them with the names of law firms they were expected to hire and fire. Two of those allies have been charged in the bridge case: Bill Baroni, a former deputy executive director, pleaded not guilty; David Wildstein, the former director of interstate capital projects, pleaded guilty to conspiracy and is cooperating with prosecutors.

Atop the list of favored law firms was Dughi Hewit, a 24-lawyer Cranford firm, where Christie spent his first 15 years as a lawyer. Baroni and Wildstein repeatedly told PA officials that the administration wanted Dughi Hewit in the mix of firms getting outside counsel work. In September 2010 the firm was awarded a contract to represent the agency in litigation with developers of a marine terminal in Bayonne. The contract wasn't put out to bid, according to a memo signed by General Counsel Darrell Buchbinder, because of "the sensitive nature of this matter." Dughi Hewit, which didn't have PA work before Christie took office, has collected \$8.85 million since then. The firm did not respond to repeated requests for comment.

The push to influence the way contracts for legal work were awarded intensified after Christie confidant David Samson became PA chairman in early 2011. The agency was told to dispatch spreadsheets listing ▶32

FROM TOP: CHRISTINA MAZZA/NJBIZ; STACY THACKER/AP PHOTO; MEL EVANS/AP PHOTO

Charlie Rose talks to...

Gina McCarthy

The Environmental Protection Agency chief discusses new carbon limits on the U.S. power industry

President Obama's speech introducing the Clean Power Plan was an emotional one. How important is climate change for him?
I think we all know the president is a thoughtful person. The day he asked if I'd become the next administrator at EPA, I asked him if he would do something on climate, because that was the big unfinished business. He talks about his two daughters. He talks about the science that he's seeing. He talks about it as a moral responsibility, and he means that. To him, it's just unconscionable that we wouldn't recognize the fact of climate change and actually take action today, because he sees what it's already doing to the world we live in.

But will it have an effect elsewhere?
When he actually proposed this carbon pollution plan for our power industry last year, the rest of the world did notice. We had China stepping up and doing a joint announcement where they, for the first time, got away from their carbon-intensity goals and said, 'We're going to get serious, we're going to cap, and we're also going to look at renewables.' Then you have Brazil come in just a short time ago. We've had good conversations with India. For the first time, probably in the history of the United States, we were failing to do anything to take charge of a problem. And failing to recognize that if we did—and stepped forward—we could be the ones producing the renewables that the rest of the world wants to buy.

Is this plan intended as a message to the rest of the world, as well?
There are really three parts to his climate action plan. The first is mitigation, which is what we've been talking about. The second is adaptation. And the third is the international global solution. Basically, Obama said the one thing we know for sure is that we'll never have a global solution on climate change unless the U.S. takes action domestically and shows a sense of seriousness, because we're the second-largest carbon polluter in the world.

Why is this so difficult? Why are so many people opposed?
I've been looking at the data for 20 years. Back then we were talking about projections of a problem with literally no solutions we could talk about, and that's just not going to work. People need to know there's hopefulness before they're going to even admit there's a problem. If you give them a problem with no solution, they pretend it isn't happening or they stand still, because they're too afraid of it. What we see now is, we actually have solutions—and we're actually being hit with the problem now.

"This plan doesn't ask the world to change. It follows the way the world is changing"

Put this in context. What's the impact on the power industry?
The reason we can move forward in the power sector is because the power sector is transforming already. We're not making it look at renewables—it's happening because the market is demanding it. People want them. There is a transition from really heavy carbon-polluting fossil fuels to natural gas, which is much cleaner. And now we're seeing that the growth in renewables, between last year when we proposed this rule and when we finalized it, is beginning to take off.

Is that because renewables are finally becoming competitive?
While they may not be exactly there, they're there in many places. You go to places where they're not hugging a tree, they're hugging their wallets. Renewables are succeeding. That's why we can build on it. This plan doesn't ask the world to change. It follows the way the world is changing.

Marco Rubio said electric bills will rise, a catastrophe for a single mom in Tampa.
The first year of compliance, it's going to be equal to about a gallon of milk, $3. By 2025, that will go down to a dollar, and then the savings begin to accrue. So there's no way we're imposing an unaffordable plan on the very people we're trying to save.

MARK WILSON/GETTY IMAGES

Watch Charlie Rose on Bloomberg TV Weeknights at 6 p.m. and 9 p.m. ET

◀ all outside legal contracts to the governor's office, according to current and former PA officials. Christie spokesman Roberts said similar requests went to dozens of authorities and commissions as part of a broad effort to "rein in and bring discipline" to spending on outside contractors.

Gibbons, a prominent Newark firm with 220 lawyers, also saw increased billings. It raised money aggressively for Christie during his 2009 race. Samson, Baroni, and Wildstein pressed PA officials to give the firm work, according to current and former executives at the agency. In 2011, when Gibbons bid for work on the Goethals Bridge rehabilitation project, the agency awarded it the job, as well as a no-bid contract for legal work on the Bayonne Bridge replacement. Gibbons, which had $51,000 in PA contracts the year before Christie took office, has reaped more than $9 million since 2010. Gibbons Chairman Patrick Dunican Jr. says the firm's "dedicated and reputable" lawyers have represented the Port Authority for 22 years, under four Democratic and three Republican governors.

Samson is under investigation by federal prosecutors for possible conflicts of interest related to his PA work. His spokeswoman, Karen Kessler, declined to comment. PA spokesman Steve Coleman says decisions about hiring outside counsel are "based on objective criteria." Sometimes, "noncompetitive" selections are made based on a firm's expertise or the uniqueness of a case, he says.

Samson was particularly forceful in his demands to curtail legal work by DLA Piper on the World Trade Center, according to current and former PA officials. DLA secured a contract for One World Trade Center in 2007, shortly after William Gormley, a Republican who served two and a half decades as a New Jersey state senator, joined the firm. Gormley declined to endorse Christie when he ran for governor in 2009. DLA's annual revenue from the PA, which reached $10 million in 2011, had dropped to less than $4 million by 2013. Some of the decline was related to the project nearing completion, but the PA turned elsewhere for additional WTC work because of political pressure, according to current and former agency officials. E-mails and calls to DLA weren't returned. (DLA does legal work for Bloomberg LP, the parent company of *Bloomberg Businessweek*.)

When Christie came up for reelection in 2013, Gormley pivoted, publicly praising his fellow Republican. Christie won in a rout, and Gormley celebrated with other VIPs at campaign headquarters on election night.

Investigators on the George Washington Bridge case have reviewed the PA contracting but are unlikely to seek charges against anyone, say people with knowledge of the matter. Federal law doesn't bar pay-to-play arrangements, as New Jersey does. Prosecutors could try to show government officials took an action in exchange for something of value, but they'd have to prove there was an explicit quid pro quo. —*David Kocieniewski and David Voreacos*

The bottom line Governor Christie's appointees at the Port Authority allegedly used contracts to reward loyalty.

Agriculture

Bill Gates Runs Afoul Of the Vidalia Cartel

▶ **The richest man in the world is no match for Georgia's farmers**

▶ **"It's a very small group of people down there"**

The squat, sweet Vidalia onion is the Champagne of the allium family. By federal law, an onion bulb can be marketed as a Vidalia only if it's grown and packed in the region surrounding its namesake Georgia town. Growers have built a market worth as much as $168 million a year, and they're vigilant about protecting it. "If we let issues fall through the cracks, the Vidalia onion will be just another sweet onion," says Jason Herndon, chairman of the Vidalia Onion Committee, a growers' group.

In April the committee called out Stanley Farms after competitors complained it was getting produce, including organic Vidalias that failed on most farms this year, to market faster than better-equipped operators at the start of the season. They say they later spotted something extraordinary: a truck of yellow onions from Florida being unloaded at Stanley's packing house.

According to an auditor's report the state later commissioned, some of those onions came from a farm owned by limited-liability companies controlled by **Cascade Investment**. The Kirkland (Wash.)-based entity was created to manage Bill Gates's $85 billion fortune. Stanley Farms, a third-generation Vidalia operation, was acquired last October by Cascade, which paid $6.68 million for one 6-acre tract and several million dollars more for nearby parcels through an LLC, Stanley Produce Georgia. Michael Larson, Cascade's fund manager, didn't return phone messages seeking comment; members of the Stanley family also didn't return messages.

Other Vidalia growers staked out the truck route, taking videos and pictures. "It was an anomaly, and they observed it," says Gary Black, Georgia's commissioner of agriculture. "It's a very small group of people down there." State investigators later found organic yellow onions inside Stanley's packing facility that weren't properly separated from Vidalias as required by law. "There are two things you cannot do," Black says. "You cannot pack a yellow onion in a Vidalia onion bag. And you cannot have non-Vidalia yellow onions in the packing facility when Vidalia onions are present." The only exception, he said, is if yellow onions are kept under a seal only to be broken by state officials.

After reviewing hundreds of shipping documents, the state found no evidence that the lesser bulbs had been shipped as Vidalias. In June, Stanley Farms was disciplined for a minor violation–improper storage of Vidalias. It paid no fine, though the state estimates it lost more than $100,000 worth of onions that rotted while the investigation was under way. The company's now on probation; if it errs again, the farm could forfeit its Vidalia license. "We felt that spoilage that took place was discipline enough," Black says. —*Margaret Newkirk*

The bottom line Georgia investigators put a Vidalia onion farm owned by Bill Gates on probation for violating trademark protocols.

Edited by Allison Hoffman and Cristina Lindblad
Bloomberg.com

PHOTO ILLUSTRATION BY 731; ALAMY (2)

From Frat Brothers

To FBI Suspects

▶ A memo links two hustling Web veterans to the JPMorgan hack

▶ "I'm still trying to wrap my head around it"

When Anthony Murgio and Josh Aaron ran the place, the Phi Kappa Sigma house a block from Florida State University's Tallahassee campus was a hive of digital moneymaking. Led by Murgio (chapter president) and **Aaron** (secretary), dozens of fraternity brothers paid their way through school writing Google ads that persuaded people to click links for everything from dating websites to electronics. Working in shifts, the brothers brought in thousands of dollars a month in commissions. For Murgio and Aaron, college life was an education in making fast cash online.

Federal prosecutors say the 31-year-olds have since used their skills unlawfully. In indictments unsealed on July 21, Murgio is accused of running a Bitcoin exchange that laundered money for hackers. Aaron is accused of a pump-and-dump scam that used expertly crafted spam e-mails to lure investors into worthless penny stock purchases, generating $2.8 million in illicit profits. Although those indictments don't involve hacking, an FBI memo reviewed by Bloomberg also links the two men to last summer's cyber attack on **JPMorgan Chase**, one of the largest bank hacks in U.S. history.

No one has pieced together how Aaron and Murgio may have gone from being promising business students to top-drawer cyber criminals, but there are hints of what may have happened along the way. Murgio racked up more than $500,000 in debt while trying to become a nightlife mogul, and Aaron moved to Israel and linked up with an alleged stock scammer.

Friends and family say they're shocked by the charges. "They were always very business-minded but always very ethical and good people," says Drew White, a video producer and fraternity brother. Lawyers for Murgio declined to comment. It's unclear whether Aaron, who's still a fugitive, has an attorney.

Murgio and Aaron met in 2002, their freshman year at Florida State. Aaron grew up in a brick colonial on a corner lot in the affluent Washington suburb of Potomac, Md. Murgio's family home sits on an acre abutting a private 18-hole golf course in West Palm Beach, Fla. Aaron's parents, Bob and Marsha, learned about the indictment hours after its unsealing and declined to comment. Murgio's father, Mike, a former high school principal who serves on the county school board, said friends would vouch for his son's "trustworthy and kind" character.

Both men had grown-up sensibilities at a young age, friends say: Neither did drugs, they were usually the designated drivers on nights out, and they were determined to become successful entrepreneurs. Murgio was outgoing and hammy, while Aaron was serious and reserved. In social media posts, Murgio called him "the Don."

After a brief stint selling kitchen knives door-to-door, Aaron introduced Murgio and their fraternity brothers to "affiliate marketing," a then-nascent business in which they crafted Google ads for companies willing to pay for traffic, taking a cut when people clicked. Friends say it was a popular job on campus, and Murgio later wrote on a personal Web page that he'd "started working for major corporations. Was flown all over the world, taken out to dinners all day and night…lots of fun."

Murgio, who also built vacation-rental websites, later said he'd made $800,000 in college. He poured it into opening a restaurant and nightclub three blocks from campus after graduating in 2007. He was profiled in *Tallahassee Magazine* in 2010, and YouTube videos show long lines of students waiting to get into the club. ▶

PHOTO ILLUSTRATION BY 731; PHOTOS: ALAMY (27)

◀ Aaron dropped out in 2005 and relocated to Miami, where he started a series of companies in pricey Palmetto Bay. Among them were a maker of air purifiers, a home-security business, and an Internet marketing firm. He and Murgio stayed close. "I still work with Josh, and we currently market many products on the Internet for various companies around the world," Murgio wrote on his personal Web page in 2013.

Aaron left few traces online, unusual for an Internet marketer. His partner in a marketing firm he started in 2010 was a former securities broker previously banned for life by the Financial Industry Regulatory Authority for violations including marketing worthless technology stocks.

$2.8m

Profit Aaron is accused of helping generate illegally, using spam e-mail

According to Aaron's indictment, a year after starting the firm he was deep in a stock-fraud scheme with an Israeli friend, which continued into this year. Aaron had moved to Israel and married a tax lawyer he met there. His bachelor party in Amsterdam reunited some of the frat brothers, including Murgio. The wedding was Sept. 10, 2014, two weeks after it became public that the FBI was investigating a breach at JPMorgan.

Starting around 2010, Murgio's nightlife business crumbled. He was in litigation with his landlord and was arrested in October 2011 after clashing with police over noise complaints. He filed for bankruptcy protection six months later, citing $545,000 in debt, and in early 2013 was arrested on charges that he stole $111,000 in unreported sales taxes his businesses collected. Murgio told friends it was a paperwork mistake, and the charges were dropped after he paid the taxes.

Soon he was back on his feet. Murgio, who often posted about libertarian causes and uses a photo of himself with Ron Paul as his Facebook profile, registered the Coin.mx domain in October 2013 and started a Bitcoin exchange. "He is a bit ADD when it comes to new ideas. Comes up with a new one every day, then on to the next," says Taylor Wilson, an ex-girlfriend. "He liked the idea of Bitcoin, liked the principle behind it, but I don't know that it was his end-all. He is an entrepreneur, always will be."

Prosecutors allege the Bitcoin exchange laundered illicit funds, including extortion payments made to hackers. In a 16-month period it exchanged a total of at least $1.8 million, according to court documents. "Anyone who really knows him believes this is all a misunderstanding," Wilson says.

Neither Murgio nor Aaron is accused of directly hacking JPMorgan. But the October FBI memo outlined some evidence linking them to the attack, including records of Aaron logging in to servers associated with the breach of the bank's main data center, where the hackers made off with personal data of 83 million customers over three months. Only relatively low-value data were removed, such as names, addresses, and e-mail addresses—exactly what you'd want for a pump-and-dump scheme, say three people familiar with the investigation. A group of elite Russian hackers that the people say teamed with the Florida State alums appears to have done the actual hacking, and the FBI hopes to use Murgio and Aaron to build the larger case.

Murgio and Aaron saw each other less after Aaron moved to Israel, but they did rendezvous in Russia. Murgio visited Moscow at least a half-dozen times starting in 2014, drawing puzzled notes from Facebook friends. Court documents show he was working closely with Russian payment processors. Social media posts show him in selfies drinking vodka and soda and posed in front of the Kremlin and the Ministry of Foreign Affairs. He partied at the City Space Bar on the 34th floor of the lavish Swissotel Krasnye Holmy in downtown Moscow, and he posted a photo of himself smoking a hookah. "Doesn't get better," he wrote in a caption. "If it wasn't 25 degrees, I wouldn't leave."

Aaron and his wife also traveled frequently to Russia starting in 2015. In a photo posted on social media accounts this year, he's wearing a Russian fur cap and posing in front of the Kremlin. He and his wife also drank at the City Space Bar. Aaron and Murgio met there in July. A photo shows them smiling as they dine along the Moscow River. Two weeks later, they were charged.

Murgio was arrested in Tampa and is free on bond. Aaron's whereabouts are unknown. Friends of both men say it's unfathomable they would be involved in the crimes they're accused of. "I'm still trying to wrap my head around it," says frat brother White. "There must be something else going on here, or some kind of misunderstanding. They both just shared a passion for business." —*Jordan Robertson and Michael Riley*

Murgio and Aaron saw each other less after Aaron moved to Israel, but they did rendezvous in Russia

The bottom line Murgio met bail. The whereabouts of Aaron, his fraternity brother and longtime collaborator, are unknown.

Software

Developers Teach Apple Chinese

▶ Coders have taken the rare step of translating Swift into Mandarin

▶ The project's originator wanted to "synchronize China and the world"

Like other smartphone makers, **Apple** is trying to keep China happy. Chief Executive Officer Tim Cook has made a half-dozen press-swarmed visits since taking over the company in 2011. (Steve Jobs made zero.) Apple began painting its iPhones gold in 2013 explicitly to appeal to the world's largest smartphone market, Cook said in an interview in June. Although the company missed analysts' estimates of its quarterly earnings in July largely because China's demand for iPhones was lower than expected, its revenue in the country more than doubled from a year earlier. The iPhone accounts for the vast majority of China's high-end smartphone sales.

Apple is also benefiting from work it's not doing. Since June 2014, more than 100 programmers have contributed to an open source Mandarin Chinese translation of Swift, the in-house programming language Apple uses for iOS development. A round of finishing touches was added last month, making it easier for 850 million native Mandarin speakers to build iOS apps. The project's originator is Jie Liang, a student at BeiHang University in Beijing, who wrote in a celebratory blog post that he began translating Swift to "synchronize China and the world."

Like many of his fellow coders, Liang was interested in developing for Apple's mobile devices but frustrated by the level of English fluency needed to work with its programming language. ▶

PHOTOGRAPHS BY MOLLY MATALON AND DAMIEN MALONEY FOR BLOOMBERG BUSINESSWEEK (5)

Hardware A Preschool for Robots

Researchers at the University of California at Berkeley are teaching robots to be smarter with the aid of water bottles, wooden toys, and child psychology. The scientists are using software to train a PR2 robot, whose head looks like a toaster crossed with a George Foreman Grill, to manipulate simple items and solve problems the way kids do: by exploring, watching, and imitating. Show it the result you want—an open bottle, a tower of blocks—and it will work its way there through trial and error, without having to rely on hundreds of hand-coded if-then commands. Researcher Chelsea Finn says the next step is to train the PR2 to manipulate a wider range of household items. ——*Jack Clark*

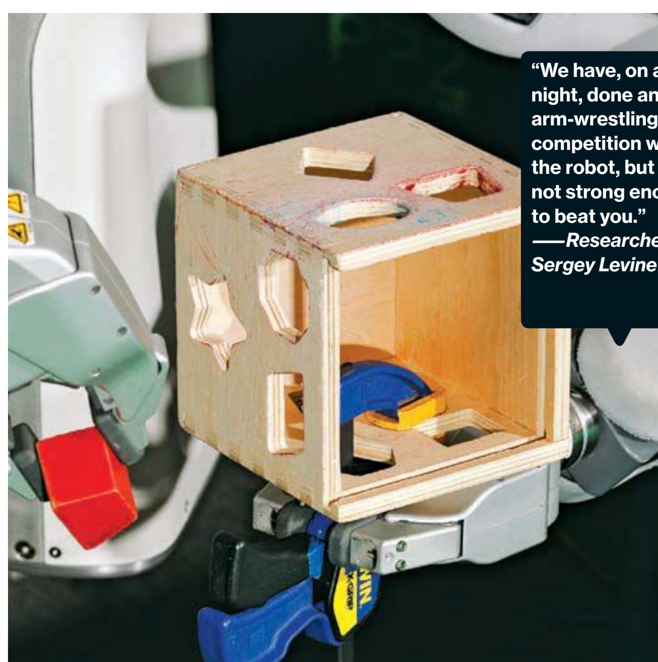
The essentials

Sight
A Microsoft Kinect sensor lets PR2 watch an object move and time when to grab it. Teaching the robot to use its data-rich eyes can take several hours.

Learning
Once trained to sort a set of blocks left in one position, PR2 can still sort them even when the blocks are moved into positions it hasn't seen before, unlike conventional robots.

Touch
Data gathered from touching things are easier for PR2 to process. Even without coded instructions, the robot will sort shaped blocks based on feel in a matter of minutes.

Hiccups
The robot had trouble correcting for a slight mis-angling of a water bottle while removing its cap. There's an emergency stop button in case of robot uprising.



"We have, on a late night, done an arm-wrestling competition with the robot, but it's not strong enough to beat you." ——*Researcher Sergey Levine*

Lesson plan ❶ Simple assembly ❷ Hand-eye coordination ❸ Functional tasks ❹ Problem-solving

◀ "I never thought there were so many people willing to join and contribute their own strength," he wrote in the blog post. The Mandarin Swift translation has been accessed more than 2 million times via open source online host GitHub.

Native language has become an increasingly important factor in international software development. Since 1840, when Britons Charles Babbage and Ada Lovelace popularized the concept of a programmable computer, code has been dominated by English vocabulary like "if," "run," and "print." Non-English programming languages exist: Mind (Japanese), Linotte (French), Analitik (Russian), Fjolnir (Icelandic), and Var'aq (Klingon). Even China has a Mandarin-native Easy Programming Language. But these are all niche compared with English-based languages such as Python and Ruby, leaving non-English speakers at a disadvantage.

That disparity reinforces itself in the business world, says Ming-Yee Iu, a software-startup founder and former Google engineer. "It's better to learn English, because the community is a lot bigger," he says. "There are more places you can sell your code to and more code you can use from other people." In 2011, Iu created Babylscript, a form of JavaScript designed to be translated. At least a dozen versions exist, including Korean, Hindi, and Swahili, but altogether only a few thousand people use them, he says.

To make code education easier for students in his native South India, Bostonian software engineer Muthu Annamalai created Ezhil, a Tamil-based programming language, in 2007. Yet like Babylscript, Ezhil is built atop an English programming language, partly to keep it more globally compatible, he says.

It remains unclear whether learning programming in one's own language is truly easier, says Andreas Stefik, a computer science professor at the University of Nevada at Las Vegas. Maintaining English as the language of choice has helped coders around the world easily swap tips and algorithms, he says, and problems of comprehension "might get worse as natural programming languages get increasingly different."

Edward Fox, a Mandarin-speaking coder, calls the Easy Programming Language "awkward, funny, and useless." Fox says he started learning to program in English before he learned to speak it, using a Chinese textbook, and that the underlying concepts are more important than the words. "I just needed to memorize all the keywords letter by letter," he says. "It's like the relationship between learning math and learning the Greek alphabet." —*Kyle Chayka*

The bottom line Mandarin-speaking programmers can now more easily code for iOS, but translation isn't an industry trend.

Data

A Technology That Reveals Your Feelings

▶ **Software sizes up your eyes, nose, mouth—even your wrinkles**

▶ **Can you verify "whether someone was actually feeling joy or anger"?**

Memo to students: Think you can fool your teacher when you're not paying attention? Think again. In the not-too-distant future, a laptop flashing a graph tracking classroom attention in real time could give you away. By the end of 2015, as many as 1,000 schools in the U.S. and Canada could be using a technology that monitors students, says Rich Cheston, chief solutions officer at **Stoneware**, a Lenovo unit that makes classroom management software. Stoneware will soon incorporate emotions analytics into one of its products to track attention in the classroom. A cousin of facial recognition, emotions analytics relies on video of facial expressions.

3.2m

The number of face videos in Affectiva's database

The teachers "can see it as they are teaching, so they can determine when to take corrective action," Cheston says. His product will come out in September, and then he will start marketing it to schools.

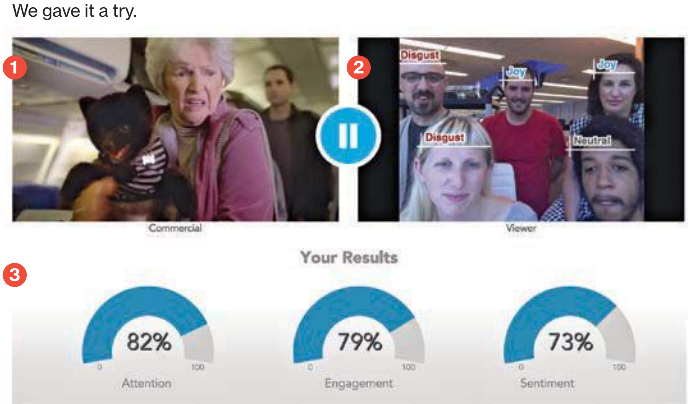
Over the past few years, big companies, including **Unilever** and **Coca-Cola**, have used emotions analytics to better understand customers' likes and dislikes and to tailor marketing and advertising campaigns. About a dozen companies are making and supporting such software, according to researcher Crone Consulting. The market leaders include **Emotient**, a startup in San Diego, and **Affectiva** in Waltham, Mass. Unilever relies on Affectiva's emotions analysis to assess customer reactions to its ads. Emotient's software will be used in Stoneware's classroom product. And Emotient tested its software with the NBA's Golden State Warriors to study how spectators respond to activities such as a dance cam.

The market for emotion-analyzing software could reach $10 billion worldwide in five years, up from more than $100 million in 2016 and less than $20 million this year, Crone Consulting says.

The software, which can be used in PCs, cars (to alert drivers when they get distracted), and smartphones, works with live or recorded video of facial expressions. How the different companies' products work varies. Affectiva's software homes in on points on a face, such as the corners of eyes or eyebrows. Algorithms also detect texture variations that occur when people laugh, frown, or smirk. Accessing its database of 3.2 million face videos, Affectiva says it can identify facial expressions and emotions with high accuracy. Its software processes video footage frame by frame to report the various emotional states

Focus Group

"Watch an ad. See your emotions," Emotient's demo commands. We gave it a try.



❶ The demo plays a Doritos commercial and records viewers' reactions.

❷ When the ad is played back, it displays those reactions in a separate window.

❸ The demo generates results based on three performance indicators.

FROM LEFT: COURTESY EMOTIENT; ILLUSTRATION BY 731; COURTESY ICEFIN (2)

of a user, from happiness to sadness, or from surprised to unfazed. It tests its emotion-recognition algorithms against images in its database.

"This is a passive way of not asking someone a question but simply observing their emotional response," says Nicholas Langevold, Affectiva's chief executive officer. Affectiva says its analysis has a 90 percent-plus accuracy rate for some emotions.

Startup **Beyond Verbal**, founded three years ago in Tel Aviv, has a database of 1.5 million voices. The company analyzes vocal intonations to identify more than 300 mood variants in more than 40 languages with 80 percent accuracy.

Susan Etlinger, a data intelligence analyst at brand consultant Altimeter Group, says the software needs to be proven. "How can you verify whether someone was actually feeling joy or anger at the particular moment?" she asks. There also are ethical considerations, because those being studied may not know it, she says.

The field of facial-emotions analytics dates to the 1970s and the work of American psychologist Paul Ekman. "I thought it was going to be used in research," says Ekman, who along with several colleagues developed a way to measure facial movements. Emotient has adapted his system. Ekman says he worries that some of the technology's uses could infringe on privacy rights. After he threatened to resign from Emotient's board, where he's an adviser, Ekman said the company is now addressing his concerns.

Microsoft has developed prototype consumer apps that track emotions via a skin sensor on an activity band and a heart-rate monitor. They alert users when stress levels are high and offer tips for coping with the stress. Some employees in the research division developing the apps share their emotions through desk crystals, which change color when users are sad, happy, stressed, or bored. "Your colleague could help you out, make you feel better," says Mary Czerwinski, a research manager at Microsoft. "But as soon as one of their bosses came in, they covered it up." —*Olga Kharif*

The bottom line The market for software that analyzes emotions could reach $10 billion worldwide by 2020.

Edited by Jeff Muskus
Bloomberg.com

Innovation

Icefin

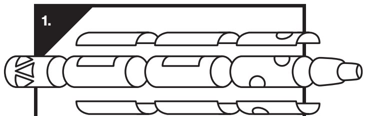
Form and function
Icefin, a seafaring robotic vehicle, uses specialized materials and modular parts to collect data and video from the floor beneath Antarctica's largest ice shelf, a proxy for the geography of Europa, one of Jupiter's moons.

Innovators Britney Schmidt and Mick West (below, right)

Ages 33 and 48

Physics professor at Georgia Tech, senior research engineer at Georgia Tech Research Institute

1.



Design Surrounding an aluminum core, a layer of yellow fiberglass-reinforced foam insulates the craft while keeping it buoyant. A built-in camera transmits video back to the operators. Internal tools measure temperature, depth, water flow, and salinity.

Origin Schmidt, West, and 52 students began work last year on their deep-sea vehicle. West runs the field tests.

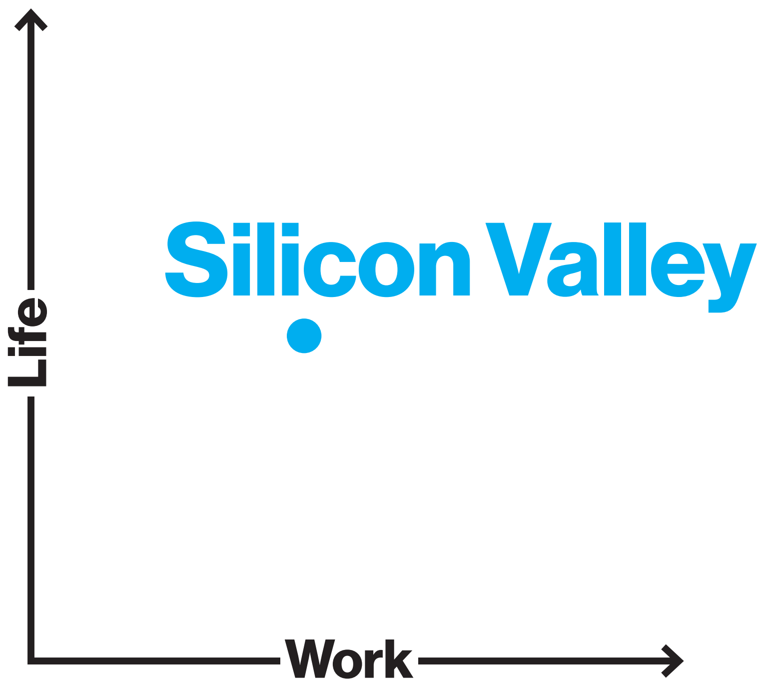
Funding Georgia Tech covered the cost of materials, equipment, and staffing. NASA paid for travel to Antarctica. Neither would say how much it invested.

Battery life Fifteen lithium ion batteries power five motorized thrusters that help Icefin travel underwater for four to six hours on a full charge.

2.

Testing The 10-inch-by-10-foot, 230-pound craft is designed to fit through holes in Antarctica's Ross Ice Shelf. Icefin can travel 1,500 meters below the surface, compared with a few hundred meters for comparable craft.

Next Steps
Schmidt's team is trying to shrink Icefin's design so it's slim enough to one day fit on a cramped rocket bound for Europa. The distant moon, covered by icy oceans, may be "the most habitable place in the solar system beyond earth," says NASA program scientist Curt Niebur. The space agency requested $30 million in its latest budget to plan a Europa mission. For now, the Icefin team needs $40,000 to meet its goal of deploying in the Arctic by next summer. —*Jennifer Chaussee*



The MBA Dilemma

▶ Harvard B-school grads shun investment banks

▶ "We say 'congratulations.' But we are thinking, 'I'm sorry'"

ILLUSTRATION BY 731

Ruined weekends, PowerPoint drudgery, and overnight shifts in Manhattan skyscrapers once were a point of pride for the Harvard Business School graduates who went to work at Wall Street banks. Now young stars boast about how lucrative and healthy their lives will be—elsewhere. "People used to brag and say, 'Oh yeah, 21-hour days, seven days a week for eight months,' that was a badge of honor," says Kiran Gandhi, a member of this year's graduating class. "The humble brag is now, 'Oh yeah, I work 9 to 5, I get paid a ton of money, and I have a great life.' It's green juice from vats in the office and amazing organic iced coffee cold-brewed—the quality of life."

The allure of Silicon Valley, where hip startups are minting millionaires, is eclipsing that of investment banks, where average pay has shriveled since the financial crisis because of a revenue slump and regulatory pressure. The number of Harvard MBAs going to Wall Street banks may hit a low this year, even after **Goldman Sachs** and others adopted policies to make them more hospitable to recruits. In 2007, about 13 percent of the B-school's graduates who got jobs went into investment banking or trading, according to the school's reports. By last year that was about 5 percent.

A preliminary survey of 2015's graduates shows only 4 percent intended to join a bank after getting degrees in May. Among the class's Baker Scholars—a designation Harvard grants the top 5 percent of MBA recipients—only one of the 45 who answered the survey expressed interest. Those are the findings of Keima Ueno, who received his MBA from Harvard in May. As a student, he served as a peer mentor and wrote a blog on what life is like at the school. He used class data from a pre-commencement survey to figure out where the Baker Scholars wanted to work. He wasn't surprised by the results. "When we hear that our classmates managed to acquire a position with an investment bank, we say 'congratulations,'" he says. "But we are thinking, 'I'm sorry to hear that.'"

Ueno knows a bit about Wall Street, having spent three years at Morgan Stanley's investment bank before returning to school for an MBA. ▶

◀ Now he's in Japan, running a startup Internet retailer and his family's health-care business.

Technology companies have been luring more top graduates with the promise that they'll not only make gobs of money but also have a happier life, according to students and recruiters. Last year, about 17 percent of Harvard's business school graduates poured into the industry, up from 7 percent in 2007, its figures show.

Hiring trends have been similar at five other selective U.S. business schools that release such data—the Wharton School of the University of Pennsylvania, Stanford Graduate School of Business, Columbia Business School, MIT Sloan School of Management, and Kellogg School of Management at Northwestern University. The percentage of students going into investment banking dropped at each of the schools from 2007 to 2014.

17%

Portion of last year's Harvard MBAs who went to work for technology companies

Lifestyle concerns aren't the only factor in the shift. New rules are forcing banks to curtail trading with their own money, pushing grads focused on investing into hedge funds and private equity firms. The tech boom is luring entrepreneurs seeking to strike it even richer.

Big banks have been fighting back, promising recruits more hours to sleep, the occasional day off, and reasonable deadlines. The effort, prompted by the 2013 death of a **Bank of America** intern, is driven in part by a fear that the brightest graduates no longer view investment banking as a sustainable career.

Schools don't typically release statistics showing where graduates landed until autumn, and Harvard isn't commenting on Ueno's tallies. Kristen Fitzpatrick, managing director of the business school's career and professional development office, says more students are thinking about banking because of the banks' recent efforts. "The work has been appealing to a lot of people for a while," she says. "It's just that the lifestyle needed to get a little better."

At Harvard, pressure on bank employees became a classroom topic. Students learn about real-life corporate dilemmas and debate strategies. "There are several case studies dealing with investment banks wherein students discuss the brutal work environment and incredibly out-of-whack work-life balance," Ueno wrote in an e-mail. "The banks' efforts—their success or lack thereof—to bring about change have not been discussed, but what is consistently highlighted is the dark side of investment banks."

Representatives of top investment banks say they're still drawing plenty of B-school grads. Goldman Sachs received more MBA applicants this year than last for its summer associate program, according to Leslie Shribman, a spokeswoman. "We continue to see strong interest in our programs from students at top MBA schools across the nation," says John Yiannacopoulos, a spokesman for Bank of America.

Banks get a bad rap, says Scott Rostan, founder of Training the Street, which prepares entry-level analysts for work in the industry. "I think it's 'the grass is always greener,' " he says. "The lifestyle of any financial-services professional can be grueling," and money management is "not necessarily night-and-day better" than investment banking. When his company surveyed 400 students graduating from MBA programs at more than two dozen campuses in May and June, banking was the top career choice. About 26 percent said they hope to join an investment bank, up from 22 percent last year. Still, buyout firms and hedge funds also gained, drawing 16 percent, up from 11 percent last year.

While conducting a study on recruiting, Matthew Bidwell, an associate professor of management at Wharton, found that Wharton graduates who became bankers later expressed the lowest job satisfaction, despite relatively high pay. Usually, higher pay and job satisfaction go hand in hand, he says. "Being at somebody else's beck and call, I think it grinds people down," Bidwell says. "It's an extreme kind of long-hours, whatever-it-takes, no-boundaries kind of culture."

"Being at somebody else's beck and call, I think it grinds people down. It's an extreme kind of long-hours, whatever-it-takes, no-boundaries kind of culture"

Recent grad Gandhi, who played drums for M.I.A. on the rapper's international tour during her first year at Harvard, says her father, who was an investment banker, never encouraged her to enter the field. She took

a job at the music streaming service Spotify. "When I first met people at HBS and they had worked in a bank, I would pick up on them feeling like they were almost ashamed," she says. "And maybe that wasn't the case when my dad was there 25 years ago, when being at an investment bank meant you were a baller." —*Jennifer Surane*

The bottom line As few as 4 percent of new Harvard MBAs may go to work for investment banks this year.

Real Estate

Mumbai's $4 Billion Garbage Dumps

▶ **Three landfills cover 740 acres of prime property**

▶ **"Living close to that will cause nothing but pain and heartache"**

Which global city uses prime real estate nearly the size of New York's Central Park to dump trash? Mumbai. The land-starved peninsula discards 11,000 metric tons of refuse every day in three dumps that together occupy about 740 acres. At going market rates, the land would be worth up to $4.4 billion if it were

Deonar landfill, Mumbai

DHIRAJ SINGH/BLOOMBERG

developed for housing. Meanwhile, 6.5 million people, half of Mumbai's population, live in slums without basic sanitation and safe drinking water.

Mumbai's landfills underscore the challenges Prime Minister Narendra Modi faces in reaching his goal of building everyone a home by 2022. "Dump yard redevelopment is very crucial," says Anshuman Magazine, chairman of real estate consulting firm CBRE South Asia.

The Deonar dumpsite sits on 326 acres in eastern Mumbai and takes half the city's daily refuse. A smaller landfill in Mulund is about 62 acres, and a 353-acre landfill is farther north in Kanjurmarg. Initially on the outskirts of Mumbai, the landfills over time were incorporated into the city limits and now occupy pricey real estate. Yet it would take years to clean up the land before anything could be built on it, says Ashutosh Limaye, Jones Lang LaSalle India's national director of research.

Rustomjee Group, a real estate developer with more than 10 million square feet of completed projects across Mumbai, declined opportunities to build in Mulund and Deonar, despite the areas' rail and highway connections to downtown. "We consciously stayed away as we believe it is unhealthy ground, and living close to that will cause nothing but pain and heartache for the people," says Boman Irani, Rustomjee's chairman. The office of Rajendra Wale, deputy municipal commissioner at the Municipal Corporation of Greater Mumbai, said Wale declined to comment.

Garbage dumps contaminate air and leach into the water table. A state-run primary school across the road from the Deonar dump resorted to having municipal water tankers bring in drinking water a few months ago. The tap water became yellow and smelly, says a teacher at Gayak Rafi Nagar Urdu Municipal school, which has 700 students age 5 through 13. Many children accompany their parents into the dump to pick through the waste and scavenge for recyclables to sell. They frequently get boils, sores, and respiratory ailments, the teacher says, refusing to be identified because he's not authorized to speak to the media. Every student is given a tetanus shot once a year, he says.

Nawab Ali Shaikh, a recycler on the fringes of the Deonar landfill, gets several tetanus shots a year. He has seen fires blaze for days as combustible gases spew from disintegrating garbage and cover Deonar in smog. And he has swept out blackened water that enters his one-room shanty during monsoons. Shaikh wants the landfill redeveloped even if it means shuttering his recycling business. "At least I will breathe clean air," he says.

To encourage developers to spend the money to clean the land, make it safe, and then build sewage, water, and electricity lines, the government could offer it at low prices, says CBRE's Magazine. Citing Mumbai's sporadic success at slum redevelopment, he says: "It shows that when you get to clean up and sell, there is a market out there." —*Bhuma Shrivastava and Anto Antony*

The bottom line Redeveloping Mumbai's garbage dumps could provide housing for some of the city's 6.5 million slum dwellers.

11,000 metric tons of refuse discarded every day in Mumbai

Muni Bonds

A Mississippi County Wins a Wall Street Bet

▶ Interest rate swaps pay off for pols who barely understood them

▶ "It's like walking out of the casino with $6 million"

Hinds County's purchase of interest rate swaps in 2006 and 2007 from **Rice Financial Products**, a New York derivatives dealer, promised to be another Wall Street deal that would cost a local government money. Officials in the Mississippi county, where one in four residents lives in poverty, didn't ▶

know what they were getting into, according to an audit of the county's finances published in 2008; for example, the officials who made the deal couldn't say how semiannual payments on the swaps were determined.

Yet in the decade since the contracts were signed, Hinds County has netted $6.7 million from the swaps, thanks to collapsing short-term rates in the municipal bond market. "It's like walking out of the casino with $6 million," says Robert Brooks, a finance professor at the University of Alabama's Culverhouse College of Commerce in Tuscaloosa. "It could've gone the other way."

As it has for so many. Since the 2008 financial crisis, municipalities have paid at least $9 billion to cancel interest rate swaps that were costing them money, according to data compiled by Bloomberg. Perhaps the best known of the victims was Jefferson County, Ala., about 250 miles northeast of Hinds County. The swaps it bought in 2002 and 2003, tied to the refinancing of $3 billion in sewer bonds arranged by **JPMorgan Chase**, helped push it into what was the largest municipal bankruptcy in U.S. history in 2011. Only Detroit's, in 2013, is bigger.

Hinds County includes Jackson, the state capital. It has 245,000 residents scattered over 870 square miles, and its median household income is $37,626, about $14,000 less than the U.S. median, according to the Census Bureau. At least three other municipalities profited from swaps with Rice. Durham County, N.C., home to Duke University, has netted $18 million since it executed a swap with Rice in 2004. Miami-Dade County, Fla., has received $160 million. Donald Rice, founder and chief executive officer of Rice Financial, didn't return calls seeking comment.

Wall Street sold the swaps as a way to reduce borrowing costs and protect the buyers against rising payments on floating rate bonds. Many governments issued floating rate debt because investors typically will accept lower initial interest rates on them than they would on fixed rate bonds. Swaps, in theory, protect the issuer against a spike in interest rates that would force it to make higher payments to bondholders. Porter Bingham of Malachi Financial Products takes issue with the notion that Hinds County officials didn't understand the terms of the swaps and their risks. Malachi was paid about $400,000 to advise on the swaps from 2006 to 2012, according to county records. "They understood perfectly what they were getting into," Bingham says. The swaps "were assessed and studied."

Officials "could not explain how the swap was supposed to benefit the county" or show they understood "the extent, multitude and nature of the various risks"

Even so, when auditor Ruth Wylie asked how the swaps worked, county officials couldn't tell her. It's little wonder—the terms were a bit complicated. In a floating rate to floating rate basis swap, the kind Hinds County bought, a local government typically agrees to pay the seller of the swap a rate equal to the Sifma Municipal Swap Index on bonds they have issued. In return, it receives interest payments at a rate equal to 65 percent of the one-month London interbank offered rate (Libor) plus a set percentage. As long as muni rates don't climb sharply relative to Libor, the swaps make money for municipalities. Many of the cases where local governments lost money involved fixed rate to floating rate swaps. While the Fed cut rates, the governments had to keep paying a higher fixed rate.

The terms of the Hinds County deal baffled Richard Ryffel, a senior lecturer in finance at Washington University's Olin Business School in St. Louis and a former public finance banker at Bank of America. "It seems needlessly complex," he says. "At some point you get so complicated, and you're speculating anyway, that there's no benefit to it."

Hinds County officials "could not explain how the swap was supposed to benefit the county nor did management demonstrate an understanding of the extent, multitude and nature of the various risks inherent in a swap," according to the audit.

Nevertheless, for most of the swaps' life, rates moved in the county's favor. Hinds used the money it netted to pay for projects such as road resurfacing and renovating the county jail. In March county officials decided to quit while they were ahead and terminated the swaps. "We've enjoyed those payments, but the pendulum, we thought, was about to swing the other way," says Tony Greer, a member of Hinds County's board of supervisors, elected in 2013. "It was just too risky for us to be in." —*Martin Z. Braun*

A Complex Wager

"If the difference obtained by subtracting USD-LIBOR-BBA from the product of 86 percent multiplied by USD-ISDA-Swap Rate is greater than .005 percent, then sum of USD-LIBOR-BBA, .005 percent, and Constant 1 all multiplied by Factor 1."
—*From a Hinds County swap contract*

The bottom line Hinds County avoided the fate of governments that paid more than $9 billion to cancel money-losing swaps.

Investing

The Mission: Save China's Stock Market

▶ A government agency gets trillions of yuan to buy shares

▶ "Opacity has already led to extreme volatility and confusion"

After China's stock markets crashed in June, the government put almost $500 billion at the disposal of a little-known state agency, the China Securities Finance Corp., headed by an academic and bureaucrat named Nie Qingping. It was told to save the market.

Housed on the 15th floor of a building in Beijing's financial district, in an office where water trickles over traditional Chinese rock sculptures, Nie and his staff of about 70 were given access to as much as 3 trillion yuan ($483 billion) to spend on stocks to prop up share prices, according to people familiar with the matter who asked not to be named because the information isn't public. China Securities Finance started purchasing the stock of blue chip companies on July 6 and that of midsize and smaller companies on July 8, according to statements from the China Securities Regulatory Commission, which oversees the agency.

So far the purchases haven't had much impact. Since July 6, stock volatility has reached nearly a 20-year high. On July 27, the Shanghai Composite Index plunged 8.5 percent. Through Aug. 3, the index is down 30 percent from its June 12 ▶

ILLUSTRATION BY 731

◀ peak. Nie hasn't given interviews, and the government hasn't spelled out just how much discretion the agency has over when and how much to buy. Neither Nie nor the agency responded to requests for comment. The agency's "opacity has already led to extreme volatility and confusion in the stock market," says Liu Yuhui, a Beijing economist and a researcher at the Chinese Academy of Social Sciences. "Investors deserve to know more about it."

China Securities Finance was set up in 2011 to provide funding for brokerages offering margin financing. "The role of stock bailout most certainly wasn't their mandate when they started China Securities Finance," says Fraser Howie, co-author of *Red Capitalism*, a book on China's financial system. "It was set up to do one job, and clearly has been co-opted or coerced–you can choose your verb–to go and do another job."

The picture of Nie that emerges from his books and commentaries, as well as interviews with fellow academics, is of a professor who spent 25 years watching stock manias–and still got blindsided by China's latest crisis. "The latest rally has the characteristics of a structural bull market," he wrote in *Caijing* magazine on March 20, joining a chorus of officials and state media commentators talking up the market's prospects. As one of the architects of China's move to allow investors to buy stocks on margin–with borrowed money–Nie played down concerns that debt-funded stock purchases were rising too quickly. He wrote that calling the runup a "leveraged bull run" was inappropriate, since investors saw value in stocks and were borrowing to invest in blue chip companies. The article came out after margin financing had more than doubled in the previous six months.

As a junior official, Nie was dispatched by the People's Bank of China to take part in an investigation of a stock mania in Shenzhen in 1990, which ultimately led to the creation of a formal stock market. People had stopped working to speculate on shares, according to his book *The Long on China*, a history of the stock market.


Nie

Nie is an accredited professor at at least two universities. He Jia, a finance professor at the Chinese University of Hong Kong who has known Nie since 1998, calls him nice, smart, and "maybe more of an academic than a government official," because of the volume of his academic writing. While Nie's in the spotlight, that doesn't mean he's in control, says He. "Things in China are never dependent on one person," he says. "It's always a plan designed by the very top." —*Bloomberg News*

The bottom line China's stock market is down 30 percent from its June peak despite government efforts to prop up share prices.

Commodities

Agribusiness Loses Some Antitrust Armor

▶ A law from the 1920s is beginning to show its age

▶ "We're not talking about John Doe Farmer with 200 acres"

Producer Power

Share of U.S. industry controlled by the top four companies

A lot has changed since an antitrust law was enacted by Congress in the 1920s to aid struggling farmers. The Capper-Volstead Act let them band together to market their products and demand fair prices from food producers. Today, many U.S. farms are part of giant agribusinesses, but in market manipulation cases the law treats them as little more than humble farmers' cooperatives.

Now lawsuits are chipping away at the little-guy protections bigger producers have claimed. In June, a federal judge approved a $5.5 billion payment by the United Potato Growers of America to settle a class action claiming price-fixing. Egg producers including **Hillandale Farms** and **NuCal Foods** this year agreed to pay more than $8 million to settle claims that they conspired to raise prices. And a judge is expected to rule in October on a suit claiming the National Milk Producers Federation, responsible for 70 percent of the U.S. milk supply, subsidized the premature slaughter of half a million cows to push prices higher. Producers in all cases deny wrongdoing.

The top four companies in each industry control 85 percent of beef packing, 64 percent of hog packing, 57 percent of poultry processing, and 30 percent of egg-laying hens, according to Food & Water Watch, an advocacy group. "The idea of these small independent farmers being able to come together to keep from being screwed by the buyers has been eclipsed by time and massive consolidation," says Thomas Horton, a law professor at the University of South Dakota. "You have this antiquated law, and now you have the courts trying to struggle to say, hey, this is not carte blanche to engage in all kinds of anticompetitive behavior."

Grocers and wholesalers accused the potato growers of forming a cartel–"the OPEC of Potatoes"–to inflate prices by planting fewer acres and destroying crops. "Despite negotiating a settlement, potato growers steadfastly maintain they did not participate in any illegal activity or wrongdoing," the United Potato Growers said in a statement.

In the milk case, the dairy federation took fees from its members and used them to pay producers who slaughtered productive cows prematurely, according to the lawsuit filed by California consumers. From 2003 to 2010, the program killed more than 500,000 cows, cut the milk supply by 10 billion pounds, and increased revenue from raw farm milk by a total of $9.55 billion, the complaint said. The milk producers countered that they were a farmers' cooperative exempt from antitrust laws. The program complied with the law, says Chris Galen, a spokesman for the federation.

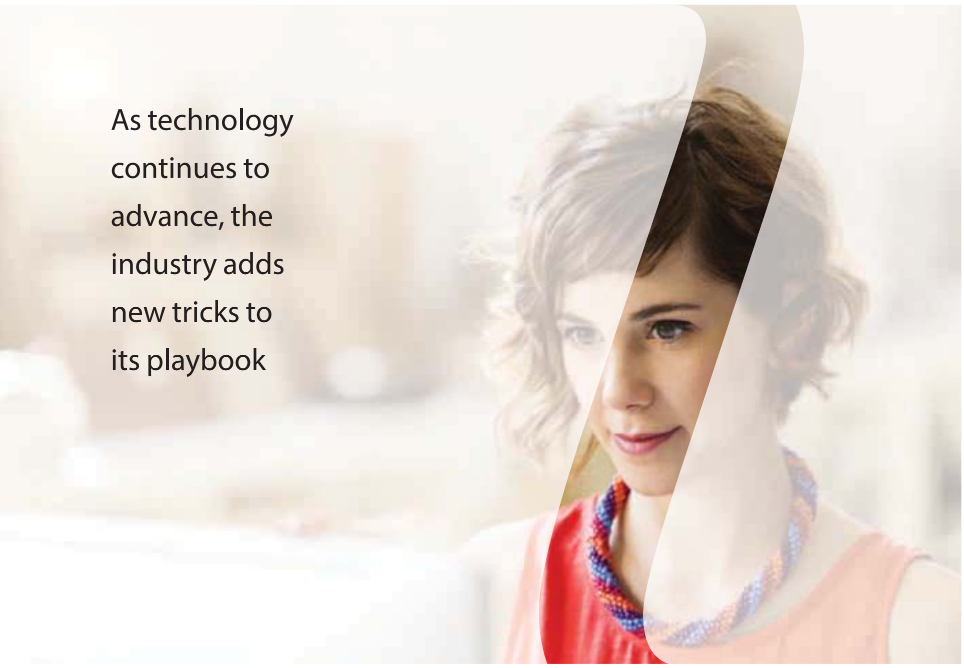
"We're not talking about John Doe Farmer with 200 acres and some dairy cows," says Peter Carstensen, a University of Wisconsin Law School professor who's called for changing the rules. "From a consumer perspective, a lot of this directly affects the price of commodities." —*Isaac Arnsdorf*

The bottom line Denying wrongdoing, growers accused of forming "the OPEC of Potatoes" will pay $5.5 billion to settle price-fixing claims.

Edited by Eric Gelman
Bloomberg.com

FROM LEFT: IMAGINECHINA (1); ILLUSTRATIONS BY 731 (4)

What's Next for Human Resources?



As technology continues to advance, the industry adds new tricks to its playbook

An abundance of tech tools has smartened up the human capital management (HCM) business over the past 10 years, and taken the drudgery out of applying for jobs. But the advent of fancier technology hasn't only affected processes. These new tools have had a profound impact on the way HR does business, triggering new visions of what's involved in the talent acquisitions task and how companies must adapt to stay competitive.

"Recruiting in particular has seen the most change, and is probably the most progressive in the HCM area overall," says Susan Vitale, Chief Marketing Officer for iCIMS, a leading provider of software-as-a-service (SaaS) talent acquisition solutions.

These days, as HCM hiring processes embrace social media, mobile, video and the collection and analysis of Big Data, the industry has been forced to develop a new playbook. The biggest change, Vitale notes, has been the incorporation of concepts from marketing and sales into the mix: Companies see ways they can burnish their brand; candidates are consumers that must be wooed.

"For years, companies have seen an obvious parallel between recruitment and sales," Vitale says. "Baseline, what a company does is cold-call candidates and sell them on working for them. However, at iCIMS we strongly feel that you can't effectively sell without marketing. It's why it's now so critical in the recruiting process." Take video, which, according to Vitale, is one of the four most impactful aspects in a new, consumerized hiring paradigm, along with social media, mobile and enhanced analytic capabilities powered by machine learning.

Video allows candidates to upload presentations about themselves, and videoconferencing cuts company costs for screening interviewees. Further, video allows companies to burnish their brands by showing clips about themselves—and open positions, of course—on job and social media sites. "When candidates see companies make videos, they think of them as innovative," Vitale adds. "That's attractive, and it's important given that 70 percent of candidates say their perception of a company's culture impacts their decisions about who they work for."

These days, companies see job candidates as consumers that must be wooed.

Analysis of collected data has also advanced by leaps and bounds since keywords were first used to winnow down candidates. Analytic tools that leverage machine learning can actively suggest possible candidates to recruiters based on the searches they've been making. Meanwhile, mobile technology increases access; Vitale says 30 percent of iCIMS' more than 3,000 customer companies receive applications from mobile devices.

Social media only amplifies this trend, allowing friends to tip off one another about jobs, widening the pool of candidates. "It's like a referral program," Vitale says, noting that some estimates indicate that applicants who arrive by way of referral are 14 times more likely to be hired.

In keeping with the sales and marketing approach, Vitale says that by using iCIMS' proprietary Social Connect Portal, a company can follow up with leads, just as a sales team would, and nurture relationships with "passive candidates"—people who show an interest in the company, but aren't yet ready to apply for a job.

In business for 15 years, and with more than 35 percent year-over-year GAAP revenue growth, iCIMS believes the adoption of marketing concepts in talent acquisition is in its infancy. "Right now, with companies challenged by talent sourcing shortages, we see a need to bring together all the new talent acquisition facets—as well as traditional concerns—into a centralized, easy-to-use hub," Vitale explains. "This creates a single platform to give businesses all the key information, instead of forcing them to log into multiple systems. iCIMS is moving toward that standard of a one centralized home base for all things talent acquisition. And that is absolutely the future." — *John O'Mahony*

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Spanish Politician
Joaquín Almunia Amann is a Spanish politician and formerly prominent member of the European Commission. Wikipedia
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Political party: Spanish Socialist Workers' Party
Education: John F. Kennedy School of Government, University of Deusto, École pratique des hautes études
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Lawrence "Larry" Page is an American computer scientist and entrepreneur who cofounded Google Inc. with Sergey Brin, Shivaun and Adam Raff corporation's current CEO. Page is the inventor of PageRank best-known search ranking algorithm. Wikipedia
Born: March 26, 1973 (age 42), East Lansing, MI
Height: 5' 11" (1.81 m)
Net worth: 29.2 billion USD (2015)
Spouse: Lucinda Southworth (m. 2007)
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Google's European Nightmare

Why the search leader's antitrust deal fell apart—and turned into a $6 billion threat

By Brad Stone and Vernon Silver

As the global elite gathered at the World Economic Forum in Davos in January 2014, Google Executive Chairman Eric Schmidt and four other executives from the Internet search giant were meeting in a conference room at the newly opened InterContinental, a golden, egg-shaped structure nestled incongruously in the snowcapped Swiss Alps. They hoped to finalize a settlement with Joaquín Almunia, the European Union's powerful competition czar and Google's primary legal adversary for the previous four years.

The mood in the room was cordial but tense. Almunia's term was up in the fall, and Google didn't want to have to start over with his replacement. Its previous two proposals had been picked apart by an assortment of 20 Google rivals, which had filed formal complaints to Almunia and the EU alleging that Google used its overwhelming dominance in Web search to divert users to its own services. For example, when someone in a European city searched for the best restaurants, nearby dentists, or airplane flights, Google linked to its own maps and other services instead of displaying links to the best content from elsewhere on the Web. Now, Schmidt told the group, his company was willing to do both. When consumers queried Google with phrases like "red Sony camera" or "flights to Rome," he said, calling up a PowerPoint slide to demonstrate the compromise, Google would prominently place a box at the top of its results page that contained links and logos of three rival websites, such as Yelp, TripAdvisor, and Expedia.

"We don't want to be a digital colony of the U.S. Internet giants"

As Schmidt finished the deck outlining the proposal, Almunia, 67, an avuncular economist who'd run unsuccessfully for prime minister of Spain, peppered him with questions. He asked how Google's rivals could obtain this special placement (they would have to bid for it in auction) and how it might affect the behavior of users (no one quite knew). Google's top lawyers, Chief Legal Officer David Drummond and General Counsel Kent Walker, helped Schmidt answer. Then Schmidt inquired about worsening anti-American sentiment in Europe in the wake of leaks by former National Security Agency contractor Edward Snowden. Any agreement would need the consensus of all 28 members of the European Commission, which is why Google hoped it had found its champion. Schmidt asked whether Almunia could get a settlement approved before the end of his term. Almunia said he was confident that he could. After two hours, everyone was satisfied. They shook hands.

Ten days later, Almunia stood at the podium in an auditorium on the ground floor of the Berlaymont, the 50-year-old institutional headquarters of the European Commission, and announced the deal. Google's long-running antitrust ordeal in Europe, it seemed, was finally over. At Google's headquarters in Mountain View, Calif., the Almunia settlement with the EU was seen as such a fait accompli that staff assigned to the case started to work on other things.

It turned out to be a huge miscalculation. Almunia couldn't muster the political support inside the European Commission to ratify the deal. It never even came up for a vote.

ALL IMAGES: GOOGLE SCREENGRABS

On April 15, 2015, Almunia's successor, Margrethe Vestager, a 47-year-old former finance minister from Denmark, approached the same Berlaymont podium in the same auditorium. "Dominant companies can't abuse their dominant position to create advantage in related markets," she said bluntly, formally accusing Google of exploiting its supremacy in general search to dominate the market for online product searches—the equivalent of an indictment, the very move that Almunia had sought to avoid through the private settlement at Davos.

That wasn't all. Vestager (pronounced Vestayer) announced a new investigation into whether Google had abused its dominant position with the Android operating system for smartphones. She suggested other cases were possible, too—regarding Google's expansion into the markets for local search, maps, images, travel, etc. For Google, this was a nightmare portending years of scrutiny, a fine of up to $6 billion, and edicts that could forever limit the effectiveness of its products. The company must file a response to Vestager's "statement of objections" by Aug. 17.

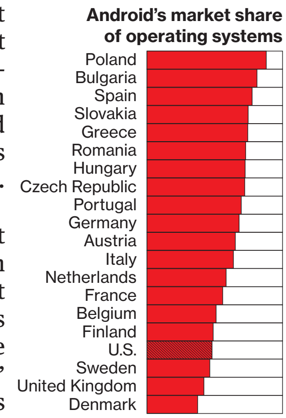
In the span of just 15 months, Google somehow lost Europe.

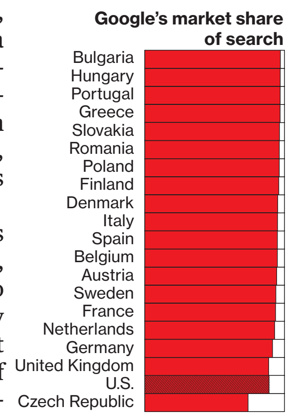
Google had reason to believe it was loved on the continent. Free-speech advocates had cheered when it shuttered its China site in March 2010 to avoid self-censorship rules. Likewise, it was a darling of digital-rights activists during the following year's Arab Spring, when Egypt jailed Google's Middle East marketing head, Wael Ghonim, after he organized protests. In 2012, as evidence mounted that governments were targeting dissidents from Syria and other countries with malware, Google rolled out a warning system for Gmail users that alerted them to potential state-backed attacks. It gave everyone else additional protection by using HTTPS (the encrypted version of the Web's underlying protocol) and offering two-step authentication at login. "They'd been good about the attempts to attack their users," says Ben Wagner, co-founder and director of the Berlin- and Frankfurt-based Centre for Internet and Human Rights. "They were an alternative, safe space."

Whatever goodwill it had stored up, Google started to lose in 2014, in the aftermath of the Snowden affair. Several of the leaked NSA documents revealed how Google and other companies had given the spy agency access to users' accounts. Google said it was following the law and fought the NSA practice, but the damage was done. "What's the use of a two-factor authenticated e-mail if the NSA is reading it, too?" Wagner says. "There was a huge shift."

In Berlin, activists from the Peng Collective lampooned Google's data-collection practices by staging a fake product launch for "Google Nest" at the Re:publica digital-culture conference in May 2014. The suite of products included Google Trust data insurance ("It's completely free, you pay with your data"), the Google Bee personal drone, which watches your family, and Google Hug, which connects users with others in need of affection. "With our unique behavioral monitoring algorithms, embedded within all Google tools and services, we know when you're not at your best," a spoof product page said. At the December congress held by the Berlin-based hacker association Chaos Computer Club, one hourlong speech was titled "F--- Off Google." Delivered by an anonymous Frenchman, it cited Google Maps as evidence of the company's statelike ambitions. "One never maps a territory that one doesn't contemplate appropriating," he warned.

Google declined to make its executives available for on-the-record interviews, but several concede that the company was caught off guard by the intensity of European criticism, in large part because of its broad popularity with users. Google is so relied upon that many people casually assert that the most prevalent search term on rival Bing is, in fact, "Google." (Microsoft declines to confirm this.) The company has a commanding 90 percent share of the search market in most European countries, vs. 76 percent in the U.S., and its Android operating system has a 64 percent share, vs. 47 percent in the U.S.





DATA: STATCOUNTER

"Google is the most popular search engine in Europe because it is built for consumers and helps them quickly find the information they want," Matt Brittin, Google's president for Europe, Middle East, and Africa business and operations, said in a statement. "Competition in search, online shopping, and access to content has never been greater."

The more Europeans rely on Google, however, the more they've come to fear it, making it an easy target for politicians. Last November members of the European Parliament voted 384 to 174 for a symbolic proposal to break up the search giant into two separate pieces—its monolithic search engine and everything else. In Spain, Google has been forced to shut down Google News over copyright issues. In Germany, it has stopped collecting images for its Street View navigation service because of privacy concerns. The memory of Stasi secret police surveillance in the former East makes such issues especially sensitive. More recently, Google has been forced to comply with an EU "right to be forgotten" ruling and to remove embarrassing items from its search database at the behest of users.

Sentiment also turned against other American tech giants, including Apple, Facebook, and Amazon.com, which were lumped with Google into a group disparagingly dubbed GAFA. Apple and Amazon's European tax arrangements were investigated; Facebook came under fire for its insatiable collection of personal data. Local politicians turned bashing

GAFA into a campaign staple during the fall 2014 elections. "We don't want to be a digital colony of the U.S. Internet giants," said former French Economy Minister Arnaud Montebourg in an interview last year. "What's at stake is our sovereignty itself."

Rewind the clock a decade, and zoom in on Berkshire, England, the home of Windsor Castle, west of London. There, a married middle-class couple, Shivaun and Adam Raff, opened a shopping website called Foundem, allowing people to search for and compare the prices of various products at other online retailers.

There was nothing particularly special about Foundem, but in 2006, Google, as it frequently does, updated its search algorithms. Suddenly Foundem was a lot less visible in search results. Shivaun, an articulate and tenacious advocate for her tiny site, spent a few years trying to get Google to tell her what had happened and how to get her company out of the algorithmic penalty box. Google, characteristically opaque about its internal workings, didn't say much.

In 2009 the Raffs filed the first antitrust complaint against Google in Brussels. They also hooked up with Gary Reback. A Silicon Valley lawyer and serial agitator who had represented Netscape against Microsoft in its 1990s antitrust case, Reback helped the Raffs make the rounds in Washington. Soon regulatory authorities began looking at Google's behavior in the U.S. and Europe. "Under European law, being dominant is not a problem at all, but once you are dominant you have a special responsibility not to crush the remaining competition in the market," Shivaun says.

Google had reason to believe this was part of a plot led by its chief rival, Microsoft. Foundem was a member of one of those earnestly named lobbying groups, Icomp, or the Initiative for a Competitive Online Marketplace, which counts Microsoft as a founding member. Raff was paid to be a special adviser, which made her seem more like a mercenary than an entrepreneur.

There were other Microsoft-looking fingerprints on the case as well. It's a member of FairSearch, a lobbying group formed in the U.S. by Expedia and others in an unsuccessful effort to block Google's acquisition of airfare data company ITA Software; the group's also focused on drumming up antitrust troubles for Google in Europe. Google didn't receive any complaints from online shopping site Ciao, an advertising partner, until after Microsoft acquired it, wrote Julia Holtz, Google's senior competition counsel, in 2010. Microsoft, through its Brussels office, declined to comment.

Aided by Microsoft or not, the Foundem complaint identified something true about Google: It favored its own services. In 2007, Google had introduced a feature called Universal Search that anyone who uses the site will recognize and likely deem useful. If you search for a particular city address, a stock quote, or the price of a product, Google will retrieve an answer to that query in the form of results from one of its own services—Google Maps, Google Finance, and Google Shopping, for example.

It was a philosophical shift. Chief Executive Officer Larry Page and his colleagues had spent years talking about how their search engine was an unbiased arbiter that directed users to the most useful, reputable material on the Web. Now, in some cases, it wasn't neutral at all.

The company said the switch improved the user experience. "If we know the answer, it's better for the consumer to answer that question so that they won't have to click anywhere else," Schmidt told a U.S. Senate antitrust subcommittee. He also pointed out that the top algorithmically selected search results are still there, a little lower down on the page, and that no one is forced to use Google. Competition is only a click away.

Over the next few years, Google kept increasing the visibility of its own content, introducing tools like OneBox, which supplied answers to specific queries in a box at the top of search results. It also started integrating profile pages, contact information, and customer reviews into search results from the barely used Google Plus social network—for a restaurant, say, or a popular hotel. Most of the time that information appeared above the blue links to websites with more comprehensive data, such as the review site Yelp or travel site TripAdvisor.

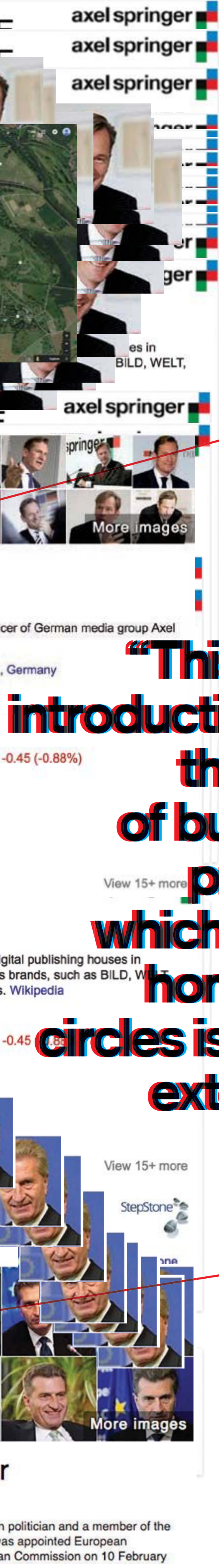
These practices enraged companies that had depended on Google. In some cases, Google's Web crawling software was "scraping" or copying selections of actual reviews and rankings and using the data to populate its listings. (The company stopped this in 2011 after Yelp CEO Jeremy Stoppelman testified before Congress about the practice.)

Google also started pointing users searching for photographs (of a celebrity, for example) to large high-definition images presented in an easy-to-scroll-through carousel. Photo agencies such as Getty Images, which had its own photo search engine, saw their traffic plummet. Even worse, some Getty clients stopped paying to license pictures because they could easily copy them off Google. "Google became the No. 1 source for the piracy of images," says John Lapham, general counsel at Seattle-based Getty, which became an official complainant to the EU antitrust case in June.

Critics now draw from a wealth of evidence about the decision-making inside the Googleplex during this period, owing to perhaps the strangest twist in the entire case. Earlier this year every other page of a staff memo written by the Federal Trade Commission's Bureau of Competition was mistakenly included in the response to a Freedom of Information request made by the *Wall Street Journal*. The 169-page FTC document quotes liberally from internal e-mails and memos, during the time when Google's partners were noticing many of these changes to the search engine—and what they contained seemed incriminating.

Google engineers wrote that users often preferred websites Google suppressed in search results over its own services. Google employees also expressed concern that price-comparison sites could siphon away users who were the most likely to spend money online. The documents also showed Google executives Page and Marissa Mayer, among others, advocating for favoring Google's own services, even if its algorithms deemed that information less relevant or useful.

Smoke was pouring from the gun. But in early 2013 the five FTC commissioners voted unanimously to



drop the case, concluding that Google might indeed be a monopoly, and that it might be hurting competitors, but that it wasn't harming consumers at all.

Rivals point to dark conspiracies behind the FTC's decision. Google was spending tens of millions lobbying the U.S. government; it was unusually cozy with the Obama administration; ex-Googlers worked in the White House. That was technically true. For U.S. regulators, though, the case didn't fit into contemporary notions of U.S. antitrust law, which seek to protect consumers, not competitors. Users were, in most cases, benefiting from easy access to answers without having to click and visit another website.

"Any negative impact on actual or perceived competitors was incidental to that purpose," the FTC wrote. That left the EC's Almunia as the only person standing between Google and total vindication.

Almunia, a pragmatist, wanted to avoid complex litigation that could drag on for years and become irrelevant in the fast-moving technology industry. After losing his bid to be Spain's prime minister in 2000, Almunia had built a new career in Brussels. His 2010 appointment as competition commissioner gave him the shot at a role he'd long sought on the global stage.

"This is the introduction ... of that kind of business practice which in less honorable circles is called extortion"

A transatlanticist, Almunia enjoyed relationships with key figures in Washington and Silicon Valley. He loved talking privately to the media. In one disclosure that threatened to undermine his credibility with Google's opponents, Almunia bragged to the *New York Times* that he had Schmidt's personal cell phone number and that the two exchanged text messages.

In 2013, Almunia "market tested" the first two settlement offers, soliciting feedback from the complainants on Google's fixes. They responded that the new box of links Google offered wasn't prominent enough, and Almunia's staff suggested the box be moved to the top of the page. When the complainants protested that rival links were still too easy for users to overlook, Almunia's staff asked Google to make the links bigger and add the rival company's logos.

To Google, it was an excruciating ordeal. Executives were certain the terms were being cynically generated by Microsoft and its allies, whose true commercial interest was keeping Google in never-ending regulatory limbo. Within Google, there was a sincere belief that the company wasn't doing anything wrong.

At last, in early 2014, Almunia met with Schmidt in Davos, inside the gaudy golden egg, to conclude the deal. "No antitrust authority in the world has obtained such concessions," Almunia boasted at his press conference at the Berlaymont. He declared there was no need to test the settlement with complainants, as he had already done that with the previous two proposals.

The final step was bringing the deal to a vote in the College of Commissioners, a group of 28 political appointees, one for every EU country, with each commissioner in charge of a specific portfolio such as agriculture, justice, or trade. Since they're not professional regulators, they're expected to rubber-stamp complex deals made by a member of the group. Before they could, though, a storm erupted over a competitor's editorial.

In April 2014, Mathias Döpfner, CEO of Axel Springer, wrote an open letter to Schmidt for the *Frankfurter Allgemeine Zeitung* titled: "Why We Fear Google." Axel Springer is the largest and most powerful media company in Germany and perhaps all of Europe. It publishes *Bild*, a tabloid with four times the circulation of the *New York Times*. Döpfner's letter is an extraordinary admission of powerlessness by a very powerful man. His concerns ranged from his own, narrow dependence on Google's traffic to the broader role Google plays in all facets of daily life, liberal society, free expression—and to whether Google will become a "digital supra-state."

When Google favors its own services, he writes, "It is not even clearly pointed out to the user that these search results are the result of self-advertising. ... This is called the abuse of a market-dominating position." Of the proposed settlement with Almunia, he says: "This is not a compromise," because of the requirement that Google's rivals bid in an auction for placement in the new search box. "This is the introduction, sanctioned by an EU authority, of that kind of business practice which in less honorable circles is called extortion."

Döpfner, 52, is known as a cunning executive. In Germany, the recurring joke is that he would run for political office but doesn't want to give up his power. Soon after the letter ran, Axel Springer and Lagardere Group, the French media syndicate and owner of the Hachette Livre publishing company, launched a trade organization called the Open Internet Project to oppose the Google deal. At the same time, Deutsche Telekom, the German phone company, filed its own antitrust complaint against Google, becoming one of the first large European companies to join the fight. The case against Google no longer seemed like a conspiracy led by Microsoft. European Big Business didn't like the settlement either.

During the months in which Almunia's Google deal was waiting for a ratifying vote, the political opposition found its voice in Günther Oettinger, a lawyer and former tax consultant who occupied Germany's sole seat in the College of Commissioners. Oettinger, 61, had risen through the ranks of Chancellor Angela Merkel's Christian Democratic Union party and was almost certainly listening to the media companies and telecoms that were uniting against Google. After Almunia presented the final settlement to the commission, it was Oettinger who complained the loudest that the other commissioners hadn't been properly consulted.

Google lawyers never saw Oettinger coming. His portfolio was energy policy, so they had never met or discussed the case with anyone on his staff. Now suddenly he was an expert on Google and Internet policy, skillfully channeling the fears that German industrial giants like Daimler and

Bosch had about Silicon Valley upstarts such as Tesla and technologies like driverless cars. "If we do not pay enough attention, we might invest in producing wonderful cars, but those selling the new services for the car would be making the money," he said in one televised interview.

Later elevated to digital commissioner, Oettinger proposed an EU-wide "Google tax" that would let newspapers and other publishers bill search engines for using snippets of original stories on pages. It was something Axel Springer and Döpfner had been proposing for years.

Almunia's retreat was rapid. Weeks before the EU executive arm's summer break, he surprised a half-dozen journalists with an informal briefing in his 11th-floor offices in the Berlaymont. Accompanied by his press aide, Almunia sat at a long, oval table across from the handpicked press pack and told them he was upset about articles saying he was going to ram the deal through despite mounting opposition. That wasn't true, he insisted. The settlement reached in Davos was probably going to change.

It was a stunning reversal, but Almunia downplayed its significance, instructing the journalists not to report it right away (which they did anyway). He also credited the decision to "new technical evidence" submitted to the European Commission by Yelp, Expedia, and other complainants, which he said demonstrated that the settlement would do little to funnel more traffic to competing websites.

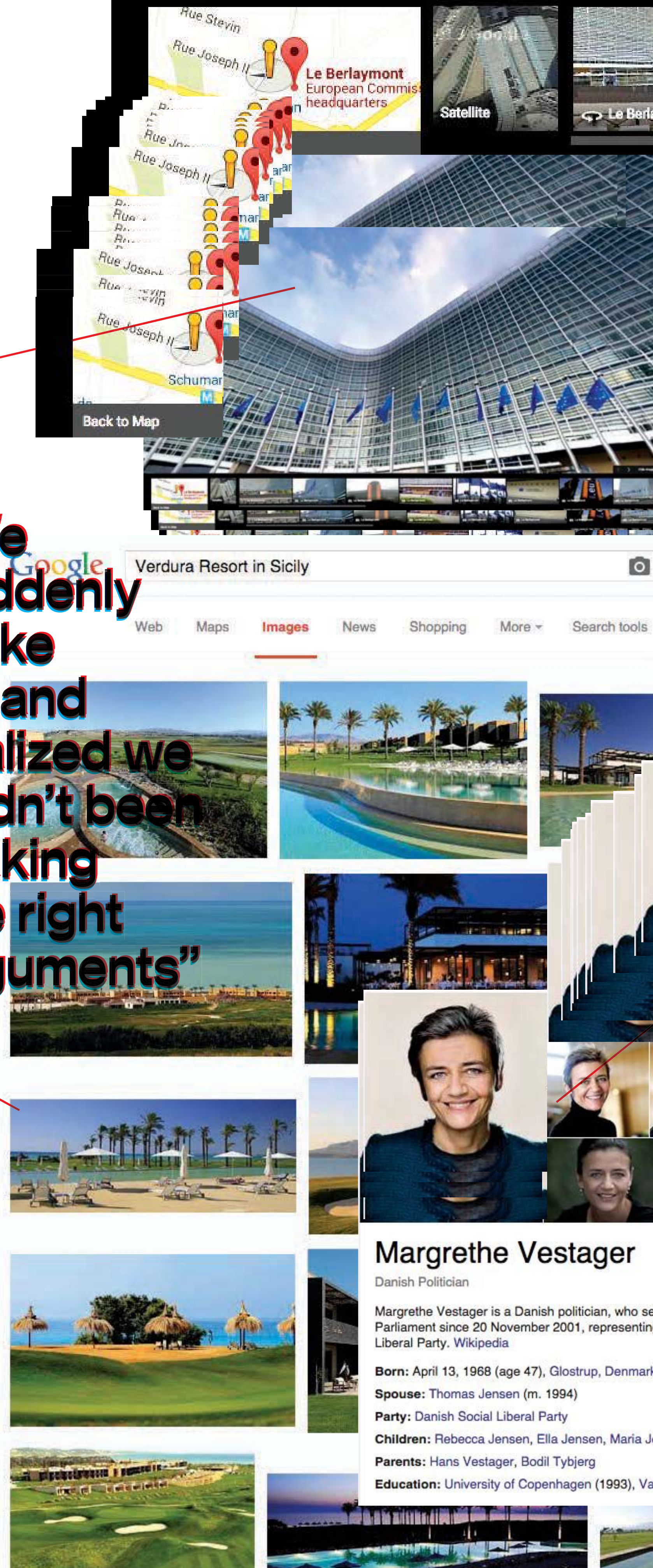
Frustrated by Almunia's about-face and perplexed by the backlash in Europe, Google invited Döpfner to debate Schmidt at a private event called Camp last August. Camp is a secretive three-day confab for Google executives, partners, and luminaries from New York and Hollywood along with their families, held at the ritzy Verdura Resort in Sicily. Page was there; so was Goldman Sachs Chairman Lloyd Blankfein and an assortment of celebrities, including Jared Leto, Rashida Jones, and Eva Longoria.

Convened on a hot night, the debate devolved into more Google bashing, this time at its own retreat. Döpfner, charmingly self-effacing and dressed Silicon Valley-style in sneakers and a hoodie (as opposed to his usual expensive suits), repeated his arguments about the unfairness of the Almunia settlement and how Google constrained innovation by linking to its own properties. Schmidt pointed out that a majority of Axel Springer's audience visited its websites directly, not via Google, and that its competing online businesses were doing well.

Logic wasn't going to win. Döpfner made an impassioned plea for European sovereignty, dignity, and the survival of local business in the face of American Internet giants. It was infectious. During the debate, Barry Diller stood up and agreed that Google was also a problem for his portfolio of Internet companies, IAC/InterActiveCorp. Vittorio Colao, CEO of Vodafone Group, added memorably, "We love Google, but we fear Google."

The impression of those paying attention—most Camp-goers were bored by the debate, attendees say—was that Schmidt lost badly. "Eric was in the weeds of the antitrust case, and Mathias was very,

"We suddenly woke up and realized we hadn't been making the right arguments"



very good," says a former Google executive who was there but asked not to be named because it was a private event. "We suddenly woke up and realized we hadn't been making the right arguments."

Google now knew its true enemy in Europe. Döpfner, who declined to comment for this article, had plenty of reasons to oppose the antitrust settlement. Axel Springer was pivoting into digital properties such as video and shopping sites and increasingly competing with Google. Its old media assets in Europe were also heavily regulated. A decade ago, for example, German authorities blocked the company from buying the ProSieben satellite TV network on the grounds that it already had too much media market power in the country. By casting a spotlight on Google and its market power, Döpfner and his media cohorts were implicitly arguing that their regulatory burden should be eased. "This is not to say there should be a downgrading or upgrading of regulation," says Axel Springer's executive vice president, Christoph Keese, who reports directly to Döpfner. "All we're asking is American tech companies or any tech companies be judged and ruled by the same competition framework we adhere to."

The Google file, says Vestager, was one of the first she took up when she arrived in Brussels. "He was sitting on my desk, so to speak," she says during an interview in her 10th-floor Berlaymont office, alone at a table in the middle of the room, a wall of windows overlooking the skyline. Vestager is tall, has spiky salt-and-pepper hair, tweets selfies, and was supposedly the model for the fictional prime minister in *Borgen*, the Danish version of *House of Cards*. Not one for small talk, she's also perfectly comfortable with awkward silences and answering questions with a simple "no."

On the subject of Google, Vestager is often obtuse. Discussing how it and other companies are shaping the digital future, she brings up Denmark's first cooperative dairy, founded in 1882 near her childhood home, and how the farmers had no idea how industrial equipment would revolutionize butter making. Similarly, she says, 21st century companies have no idea where they'll end up. She's just here to make them follow the rules.

Ten days into the job, Vestager announced she wanted to hear from all parties in the case, and Google's rivals lined up to complain. The parade of companies emerged optimistic. "She met with more of us in five months than Commissioner Almunia met with in five years," says Shivaun Raff. "She was unafraid to dig in and really understand the market. It means she is much less likely to be bamboozled by Google." Getty Images' Lapham adds: "What the commissioner has shown is a willingness to be unimpressed with any particular company if there is a belief they are abusing market dominance."

Vestager also met with Schmidt. The March meeting was the first time Google executives had made their case to her, and they got a taste of some of her idiosyncrasies, which include keeping a wooden stepladder in her office, to symbolize a woman's need to "bring her own ladder" if she wants to advance in the world.

By that time, Vestager had already heard enough. "A lot of effort has been put into the Google case before this," she says. Instead of going the settlement route again, "Maybe we should try something else, be more specific, be more open, put it in writing, to maybe enable us to solve the cases with a different approach."

With European Commission President Jean-Claude Juncker leading the April 15 meeting, she slapped Google with her statement of objections, alleging that the company favors its own price-comparison engine when users shop for products on the site.

The particulars of the case stem from Foundem's earliest charges, but it's a somewhat odd strategy, because Google is generally viewed as an underdog in product search, lagging rival Amazon, which many online shoppers visit directly.

Vestager's Android investigation is in its early stages, and complainants seem convinced that a second statement of objections could come this fall—perhaps about Google's conduct in image search and the way it repurposes high-definition pictures and pushes watermarked images from Getty and others further down in the search results.

Google recently reported quarterly earnings of $3.9 billion, and its stock is up 20 percent this year. Yet in Europe, it seems it can do nothing right. When it announced a partnership earlier this summer to invest €150 million ($163 million) to develop products with eight European publishers including Guardian News & Media and Financial Times—but not Axel Springer—the move was widely condemned as "a blackmail fund" and "hush money."

Vestager says she loves the Internet. She recalls recently helping one of her three daughters book flights, a car service, and train tickets online for a trip to the U.S. for summer school. "It took us an hour and a half," she says. "It was not even to think of when I was a child!"

She and investigators from her 900-person staff must convince the commission that Google abused its position in a way that affects trade among EU member states. How they calculate a penalty is flexible, but Vestager is showing no sign of compromise. While the document containing her charges is secret, Bloomberg has seen a redacted version the competition authority sent to Google competitors. It says the European Commission "intends to set the fine at a level which will be sufficient to ensure deterrence." More important, Google might have to change the way its search engine answers queries on desktops and smartphones. That would handicap its profitable advertising engine and curtail its ability to compete against rivals such as Apple, Amazon, and Facebook.

Although she uses Google frequently, Vestager says it doesn't cloud her view of the case. "Congratulations for being big, but don't misuse it. For Europeans, this is very fundamental," she says.

That might be the scariest thing of all for Google. It isn't dealing with an antitech ideologue or a competition czar consumed with cementing a personal legacy. It faces a straightforward prosecutor in a hostile political climate dominated by powerful local business interests with their own regulatory agendas. Good luck to Google searching for a way out of that. B
—With Stephanie Bodoni and Gaspard Sebag

The Arctic

In a windowless conference room in Anchorage, a dozen Royal Dutch Shell employees report on the highest-profile oil project in the multinational's vast global portfolio. Warmed by mid-July temperatures, Arctic ice in the Chukchi Sea, northwest of the Alaskan mainland, is receding. Storms are easing; helicopter flights will soon resume. Underwater volcanoes—yes, volcanoes—are dormant. "That's good news for us," Ann Pickard, Shell's top executive for the Arctic, whispers to a visitor.

Overhead, a bank of video monitors displays blinking green radar images of an armada of Shell vessels converging on a prospect called Burger J. Company geologists believe that beneath Burger J—70 miles offshore and 800 miles from the Anchorage command center—lie up to 15 billion barrels of oil. An additional 11 billion barrels are thought to be buried due east under the Beaufort Sea. All told, Arctic waters cover about 13 percent of the world's undiscovered petroleum, or enough to supply the U.S. for more than a decade, according to government estimates.

Despite the July 21 meeting's military-like precision, peculiarities become evident. Radar shows an icebreaker called *MSV Fennica* heading in the wrong direction—south toward Portland. Three weeks earlier, the 380-foot vessel ripped open a 39-inch-by-2-inch gash in its hull, the result of scraping against a shallow-water hazard in Dutch Harbor, Alaska. Because the multipurpose ship also carries spill response gear, the accident caused federal regulators to restrict drilling to the topmost 3,000-foot section of Burger J—and not farther down into the oil-bearing zone—until the *Fennica* gets patched up in a Portland repair facility and travels 2,300 miles back north. The detour gave Greenpeace the chance to stage a social media-friendly "#ShellNo" photo op on July 30, with protesters in climbers' slings hanging from a Portland bridge and temporarily inhibiting the *Fennica*'s movements, while "kayaktivists" heckled from the harbor. In another setback, U.S. wildlife officials concerned about noise-sensitive Arctic walruses have vetoed Shell's original plan to drill two wells simultaneously. "That caught us by surprise," Pickard concedes.

Surprise lurks in the Chukchi, whose frigid waters north of the Bering Strait span from Alaska to Siberia. Logistical and legal obstacles have repeatedly delayed the Arctic initiative, on which Shell is spending more than $1 billion a year—more than $7 billion so far and counting. The single well in the Chukchi Shell aims to excavate this summer could be the most expensive on earth, and it hasn't yielded its first barrel of crude.

Activists have sued; judges have intervened. In 2010, work stopped when the Obama administration temporarily suspended offshore drilling throughout the U.S. after the BP disaster in the Gulf of Mexico. Back in action in 2012, Shell suffered a maritime fiasco with Keystone Kops undertones: Ship engines conked out, tow lines snapped, and a massive drill barge ran aground, requiring the U.S. Coast Guard to rescue storm-stranded workers. This July 16, former Vice President Al Gore called the Obama administration's decision to approve Shell's drilling "insane."

Two weeks later, on July 30, Shell's chief executive officer, Ben Van Beurden, announced that as a result of $50-a-barrel oil, a 55 percent decline since last year, the

A GLOBAL OIL GLUT HAS TANKED PRIC
VOW TO CONFRONT CLIMATE CHANG
"EXTREME OIL" NORTH OF ALASKA?

Shell's *Polar Pioneer* in Port Angeles, Wash., on May 12

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E. SO WHY IS SHELL DRILLING FOR

BY PAUL M. BARRETT AND BEN ELGIN

company's profit fell by a third in the second quarter. Expecting prices to "remain low for some time," Van Beurden announced plans to eliminate 6,500 jobs, part of a broader contraction in a reeling industry. Even against this challenging economic backdrop, Shell won't postpone or downsize its Arctic dreams. The offshore Alaska field, Van Beurden said, "has the potential to be multiple times larger than the largest prospects in the U.S. Gulf of Mexico, so it's huge."

This raises the question of why Shell is doubling down on the Arctic amid a worldwide supply glut, and at the same time that many politicians are vowing to address global warming. Among the major oil companies, it stands out for its frank discussion of the threat posed by its business to the world's climate. Its top executives have even professed a desire to rethink fossil fuels and move toward renewable energy sources. And yet it's assuming immense operational risks to drill in the Arctic.

Shell executives don't deny the apparent contradiction. "We do believe in climate change," says Pickard. Shell's Scenarios group, an in-house think tank that management points to as an emblem of its open-mindedness, has done extensive work undergirding the company's support for government policies encouraging development of renewable energy sources, she says. But the Scenarios research also justifies aggressive exploration for more crude. With the global population rising from 7 billion to more than 9 billion by 2050 and total energy demand nearly doubling, "hydrocarbons are going to be needed for an awfully long time," Pickard says. "That's where Alaska fits into the picture."

Even sympathetic observers find it curious, though, that Shell and Shell alone sees future profit in the Chukchi, especially after its misadventures there in 2012. Chevron, ConocoPhillips, Exxon-Mobil, Statoil, and Total have all put Arctic plans on hold. "Given the environmental and regulatory risks in the Arctic and the cost of producing in that difficult setting, assuming they ever get to producing, Shell must anticipate an enormous find—and future oil prices much higher than they are today," says Nick Butler, a former senior strategy executive at BP who does energy research at King's College London. "It's a dangerous wager."

One of the most powerful women executives in a decidedly masculine industry, Pickard, 59, meets a reporter visiting Anchorage in jeans and a blue button-down shirt. Her rise through the ranks, first at the pre-merger Mobil and since 2000 at Shell, is especially impressive as she lacks the engineering or geology pedigree normally required of senior oil industry management. She has a graduate degree in international relations and has overseen exploration and production in Africa, Australia, Latin America, and Russia. "Ann doesn't suffer fools," says a (male) subordinate who pleads for anonymity.

In 2005, Shell put Pickard in charge of sprawling operations in Nigeria long shadowed by pipeline thievery, militant attacks, and accusations—denied by Shell—of collaboration with brutal government crackdowns. *Fortune* magazine in 2008 labeled her "the bravest woman in oil"—a silly accolade, perhaps, but one that accurately reflects her reputation at Shell.

Most of the world's "easy oil" has already been pumped or nationalized by resource-rich governments, Pickard says, leaving independent producers such as Shell no choice but to pursue "extreme oil" in dicey places. "I enjoy the challenge," she says. That's why in 2013, when she was planning to retire to spend more time with her husband, a retired Navy commander, and their two adopted children, she changed her mind and took over the troubled Arctic project.

Pickard emphasizes that she enjoys the outdoors as much as the next person, but she's no purist. "You hear a lot that the Arctic is pristine," she says, using air quotes. "Yeah, it's pristine in parts, but there's been oil and gas up here for a long time." She points to maps showing the enormous Prudhoe Bay complex within the Arctic Circle on Alaska's North Slope. Active since the 1960s and still one of North America's largest oil fields, Prudhoe has provided more than 12 billion barrels of crude via the Trans-Alaska Pipeline. In 1989, it was Prudhoe oil that sullied Prince William Sound on Alaska's south central coast after the grounding of the tanker *Exxon Valdez*.

Shell missed out on the Prudhoe Bay bonanza but later helped develop Cook Inlet near Anchorage. Even on the more temperate southern side of the state, conditions can get harrowing, says Robert Bea, a retired engineering risk professor at the University of California at Berkeley. While consulting for Shell in the late 1980s, he spent two months on a Cook Inlet drilling vessel. He recalls roiling seas, temperatures of -16F, and deck hands continuously chopping and hurling overboard two-foot-thick ice sheets that threatened to throw off the ship's balance.

While producing in Cook Inlet, Shell also tentatively explored the Chukchi, identifying what looked like oil- and gas-bearing formations 8,000 feet beneath the ocean floor. The Chukchi posed greater engineering challenges than Cook Inlet because of its even more severe weather and sheer remoteness, Pickard says. By the early 1990s, Shell had shut down its Arctic exploration in favor of more readily available prospects in the Gulf of Mexico.

But the company never gave up on the extreme north. In 2004 it brought Bea to the Netherlands for a week of consulting on how to respond to a potential spill in the Chukchi. Of the many producers he's advised over the decades, "Shell is one of the very best" in terms of safety, he says. Still, Bea worried when his client's engineers asserted that methods used off the coast of Southern California and in the Gulf of Mexico would suffice in the Arctic.

Within the industry, Shell has a reputation for caution associated with its stolid Dutch cultural roots, says Butler, the former BP executive. But 15 years ago, competitive pressure from bulked-up rivals, combined with the growing scarcity of easily produced oil, began weighing on the company. In 2004, around the same time Bea was visiting The Hague, Shell admitted it had overstated its global proven oil reserves by 4.5 billion barrels, or 22 percent. The ensuing scandal led to government fines in the U.S. and U.K., settlement of investor lawsuits, the ouster of the company's chairman, and consolidation of the Dutch and British branches of the corporation.

Beginning in 2005, Shell moved aggressively to snap up new drilling leases in U.S.-controlled portions of the Arctic Ocean. This process culminated near the end of the Bush administration in 2008, when Shell spent $2.1 billion at auction for rights to more than 2 million acres of subsea Arctic real estate. "Maybe in part to make up for the reserve scandal or maybe just because their [geologic] studies show more oil and gas than others see there,

**"YOU HEAR A LOT THAT THE ARCTIC IS PRISTIN
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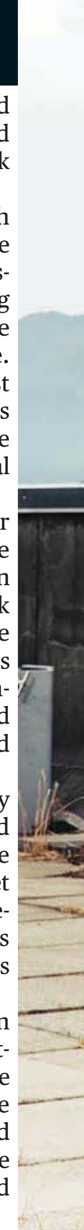


Pickard has been called "the bravest woman in oil"

E. YEAH, IT'S PRISTINE ERE FOR A LONG TIME"

Shell got way out in front in the Arctic," says Michael LeVine, Pacific senior counsel for Oceana, a Washington-based environmental group. Shell spokesman Curtis Smith says the 2004 reserve controversy had no bearing on the company's aims in the Arctic.

In 2007, LeVine and other lawyers representing nongovernmental organizations and native Alaskan groups went to court to stop Shell. They argued that regulators didn't know enough about the effects of drilling in the Arctic, that the company lacked adequate spill response plans, and that Eskimo tribal representatives hadn't been adequately consulted. Years of Whac-a-Mole litigation unfolded in federal courts in Alaska, San Francisco, and Washington: Environmentalists identified planning flaws, judges halted drilling preparation, the government and Shell proposed fixes, drilling prep resumed, and the lawyers went back to court. The six-month post-BP-spill moratorium came and went in 2010. Shell's cutting-edge three- and four-dimensional seismic technology, not available in the 1980s and 1990s, bolstered the company's confidence. In the summer of 2012, with the courts and regulatory agencies temporarily in favorable alignment, Shell returned to the Arctic. "It's just too big a prize," Pickard says. "We can't afford to leave it all there."

The moment when it ought to have become clear that the 2012 Arctic mission deserved a rethink came in mid-July, when the *Noble Discoverer*, a 514-foot self-propelled drill ship, dragged anchor in 35 miles-per-hour wind during a stopover in Dutch Harbor and nearly ran aground. The Coast Guard said the vessel came within 100 yards of shore, but photos posted by local radio station KUCB seemed to indicate it came a lot closer than that. A tugboat pulled the *Discoverer* back into deeper water.

That September, the test of a $400 million "containment dome" went seriously awry. A faulty electrical connection caused the gigantic dome, designed to limit the spread of oil in case of a blowout, to rise to the surface without warning—and not in the storm-tossed Arctic but in the relatively tame Puget Sound, off Seattle. The head of the Alaska office of the U.S. Bureau of Safety and Environmental Enforcement reported that the dome "breached like a whale," sank again, and reemerged, its top "crushed like a beer can."

Despite these forbidding omens, in September and October 2012, Shell went ahead and drilled two shallow "top holes," one in the Chukchi and one in the adjacent Beaufort Sea. The U.S. Department of the Interior banned penetration of hydrocarbon-bearing zones because of the containment dome snafu. Operating in the Chukchi, the *Discoverer*, a converted log carrier built in 1966, had to detach prematurely from the ocean floor when wind pushed a 10-mile-wide ice floe directly at the vessel. The *Discoverer* then suffered an onboard fire and propeller shaft malfunction that required the crew to shut down its engines and accept a tow to Seward, Alaska, where the Coast Guard impounded the vessel. Ultimately, Noble Drilling, Shell's contractor, pleaded guilty to eight federal felony counts related to pollution and safety infractions and paid penalties totaling $12.2 million. The *Discoverer* was loaded onto a heavy-lift ship and taken to South Korea for extensive repairs.

That wasn't the worst of it. The most spectacular failure involved the *Kulluk*, a round-shaped drilling barge that floated 250 feet above the waterline and had to be pulled by another vessel because it lacked its own power. Built in 1983 in Japan and mothballed a decade later, the *Kulluk* was purchased by Shell in 2005 and refurbished. In October 2012, after poking a shallow top hole in the Beaufort ice cap, the barge began its journey west and south, just ahead of fast-forming autumn ice. Bad weather and rough seas delayed its progress. By December it reached Dutch Harbor, where it could have spent the winter. Shell instead decided to tow the *Kulluk* on to Seattle. Subsequent government investigations found that Shell wanted to make off-season repairs that would have been more expensive and difficult to execute in Dutch Harbor. The oil company, with $467 billion in 2012 revenue, also wished to avoid $6 million in state port taxes that might have come due if the *Kulluk* remained in Alaska.

December is a perilous month for any vessel to cross the Gulf of Alaska. The dangers are multiplied by a complicated towing maneuver. The captain of the *Aiviq*, the ship pulling the *Kulluk*, sent an e-mail to a member of the 18-man skeleton crew on the barge. "To be blunt," Captain Jon Skoglund wrote

PREVIOUS SPREAD: JASON REDMOND/REUTERS; THIS SPREAD: PHOTOGRAPH BY KYLE JOHNSON FOR BLOOMBERG BUSINESSWEEK

on Dec. 22, "I believe that this length of tow, at this time of year, in this location, with our current routing guarantees an ass kicking."

On Dec. 27, with gale force winds and 25-foot swells buffeting both vessels, the 600-yard towline snapped, setting the *Kulluk* and its crew adrift. The *Aiviq* circled back and reconnected the ships with an emergency line. The next day, however, the *Aiviq*'s four main engines all failed, apparently a result of seawater flooding. On Dec. 29, hovering Coast Guard helicopters lowered baskets on ropes to scoop the 18 crew members from the *Kulluk*'s heaving deck. Just in time, as it turned out: The towline broke once again—and later, a third time. On New Year's Eve, Shell executives gave up. Cut loose, the *Kulluk* beached itself near Kodiak Island. Declared a total loss, the barge was dry-hauled to Singapore and cut up for scrap.

Multiple investigations followed. The Coast Guard faulted a series of poor decisions by Shell and its contractors. "Inadequate assessment and management of risks ... was the most significant causal factor," the agency concluded. The Department of the Interior similarly found "shortcomings in Shell's management and oversight of key contractors." In March 2013, then-Secretary of the Interior Kenneth Salazar told reporters: "Shell screwed up."

Following the *Kulluk* mess, Shell executives at the highest levels describe a period of intense internal reflection on whether to persevere in the Arctic. "I had the opportunity very early on in my tenure to say, 'That's it, let's pull the plug on it,'" Van Beurden, who was named CEO in 2013, told the *Guardian* in a May 2015 podcast. "I had to go through a personal journey on that."

Introspection and internal debate are part of the corporate ethos at Shell. While the company declined to make Van Beurden available for this article, several current and former executives were willing to discuss the tradition of looking inward, not only in the wake of mishaps, but as part of the company's year-in, year-out Scenarios process.

A dedicated Scenarios team of a half-dozen engineers, economists, and scientists working in The Hague, periodically supplemented by hundreds of experts from elsewhere around the company, compile monograph-length analyses with titles such as "Scramble," "Oceans," and "Mountains." Pierre Wack, a Frenchman who headed Shell's planning division in the 1970s, formalized the Scenarios process. "Wack was inspired by George Gurdjieff, a Greco-Roman guru who believed that most human beings who are awake act as if they are asleep," according to *40 Years of Shell Scenarios*, a coffee table book the company published in 2012. Wack "opted for a confrontational approach, breaking down [top management's] assumptions." Arguing for greater reliance on human intuition, he anticipated the 1973 OPEC crisis, the 1979 Iranian oil shock, and the decline of the Soviet Union in the late 1980s—or so goes company lore. Wack died in 1997 at the age of 75, spending his final years in a 14th century château in the Dordogne, in southwestern France.

In the years since, the Scenarios process has gravitated from mystical intuition toward econometric modeling, according to more recent participants, but it retains at least a whiff of the transcendent. "We help create memories of the future," Jeremy Bentham, who took over the unit in 2006, says in an interview.

Perhaps that helps when forecasting geopolitics. But on the environment, the Scenarios approach resembles a conscience-salving exercise that makes status quo strategies seem inevitable, former Shell executives say. As a result of Scenarios research, Shell in 1998 was one of the first major oil producers to acknowledge man-made climate change. For several years the company has even endorsed imposition of taxes on burning oil and other CO_2-emitting fuels, such as those enacted by some European countries. Bentham blames the U.S., China, and other major economies for failing to put their muscle behind this trend and impose levies that would create incentives to develop noncarbon alternatives. "We've lost 20 years collectively for the potential to moderate greenhouse gas emissions," he says.

As the number of air conditioners and automobiles proliferates in Asia, "Shell has convinced itself that renewable energy can't grow fast enough to meet growing energy demand," says Dave McCormick, who worked for the company for 30 years and on the Scenarios team from 2002 to 2009. In Shell's view, it has no real choice, he adds. It's "the responsibility of oil and gas companies to meet that demand in as reasonable a way that they can." As for Alaska, he says, the company thinks "it's not about Shell exploring for hydrocarbons in the Arctic. It's society that is demanding this energy." At the end of his personal journey, Van Beurden gave the Arctic project a green light.

Pickard says that before she accepted the Arctic assignment, she, too, did extensive due diligence, not wanting to end her

**"SHELL HAS CONVINCE
GROW FAST ENOUGH**

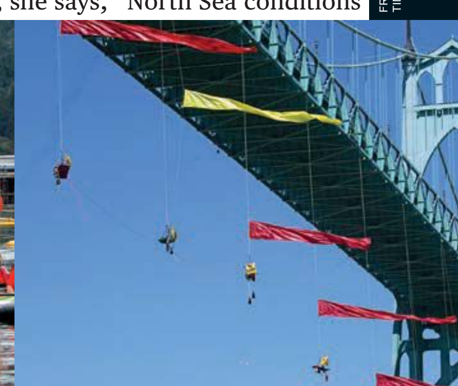
celebrated career on a down note. Her reasoning and conclusions offer a window on how a big oil company evaluates risk and benefit.

First, she says, on closer inspection, 2012 really wasn't all that bad: "A lot of things went right. They had a successful exploration season in terms of getting rigs up here, operating to top holes, and then getting back down to Alaska quite successfully." (From Alaska south, of course, not so much.)

What of the spill containment system crushed like an empty beer can? "That didn't go well," she admits. Also, "the *Kulluk* ended up on the beach. That's not anything anyone wants to see in pictures."

But past failure doesn't guarantee future failure, Pickard points out. "The perception was that the weather is far worse [in the Arctic] than anywhere else we operate," she continues. Not so. Off the U.K., she says, "North Sea conditions

FROM LEFT: KERI COLES/GREENPEACE; SAM CARAVANA/THE OREGONIAN/AP PHOTO; TIM AUBRY/GREENPEACE



ON TOP OF THE WORLD

are actually worse." Before taking over in Anchorage, she oversaw the construction of Prelude, a mammoth floating liquefied natural gas plant off northwestern Australia. It's designed to withstand Category 5 cyclones, she explains, and those don't happen in the Arctic. "We know how to operate in places where there's challenging weather," she says. "Alaska is no worse, and in many ways better than some other places."

Continuing to accentuate the positive, Pickard says the Burger J prospect lies beneath only 140 feet of water, and its crude oil reservoir is under relatively low pressure as these things go. In contrast, BP's ill-fated Macondo well lay beneath a mile of ocean and was under extremely high pressure.

"The blowout scenario is quite different than the case of BP's Macondo," Pickard says. Burger J "is the kind of thing we've done all over the world for decades."

Not to say there will be a blowout. "It's not going to happen on my watch," Pickard maintains. She has hired new talent, including a retired Navy admiral and several ex-Coast Guard officers. She's "flattened the organization a lot." Her predecessor and his inner circle in Anchorage perched several floors above the operations people; Pickard and her aides-de-camp mingle with the rank and file.

Ninety percent of the hands-on crew on an offshore project work for contractors. Pickard acknowledges that in 2012, Shell didn't supervise the hired help adequately. "The contract management side has entirely changed," she says. She has designated senior Shell employees as "contract holders" who each supervise one or two outside companies to the exclusion of other duties. "I expect our contract holder to know what the captain of the *Aiviq* had for breakfast yesterday."

Yes, she confirms, that's the same *Aiviq* that was part of the misadventure three years ago. It's been repaired and returned to action; same with the rehabilitated *Noble Discoverer* and containment dome. The wrecked *Kulluk* has been replaced by the *Polar Pioneer*, a rectangular eight-leg drilling unit 279 feet long and 233 feet wide. Built in 1985, the *Pioneer* is owned and operated by Transocean, the same Switzerland-based drilling contractor responsible for the *Deepwater Horizon* rig that exploded while working for BP in the Gulf of Mexico in April 2010, killing 11 men. Thirty vessels are expected to be in the vicinity of the Burger J prospect, about the same as in 2012, with the *Discoverer* backing up the *Pioneer* and available to drill a relief well in the event of the blowout Pickard guarantees won't occur.

The National Research Council, the working arm of the National Academies of Sciences, Engineering, and Medicine, has a more pessimistic view. "Coast Guard personnel, equipment, transportation, communication, navigation, and safety resources needed for oil spill response are not adequate for overseeing oil spill response in the Arctic," the council concluded in a report last year.

Pickard disagrees. She says she can get all of her gear—capping stack, containment dome, surface booms, skimmer boats, tankers—in position within 60 minutes of an accident.

As she sees it, the damaged *Fennica*'s detour to Portland proves her point. Yes, the icebreaker suffered a puncture wound in Alaska. But rather than attempt a quick fix, she sent it to Portland for a more thorough repair in dry dock. The *Fennica* also happens to carry the capping stack, a massive piece of spill response equipment that would come into play to plug an out-of-control well if another device, the blowout preventer, failed to do the job. Pickard left the capping stack on the *Fennica*, even though that decision prompted the Department of Interior to ban Shell from penetrating Burger J's oil zone until the *Fennica* returned to the vicinity of the well.

Pickard calls the management of the *Fennica* "a perfect example of operating exceptionally well." On July 30, the ship maneuvered past nine remaining protesters hanging from Portland's St. Johns Bridge and headed out to the Pacific on its way to the Chukchi.

Anticipating the *Fennica*'s return, the *Polar Pioneer*'s drill bit began spinning into the seafloor to carve a "mud-line cellar," a 20-by-40-foot space that will house the blowout preventer (BOP). In most offshore projects, the BOP projects above the seabed. Shell is burying the device to minimize potential damage from any large, unseasonal underwater ice floes of the sort that forced the *Discoverer* to detach and retreat from its top hole in 2012.

If all goes well, Shell will drill through in late September, at which point Pickard says she'll order the fleet to move south for the cold months. Shell will have to come back for 15 summers before "first oil" flows through an as-yet-unconstructed 70-mile seafloor pipeline to the Alaska coast and then a 350-mile overland connector (also yet to be built) to the Trans-Alaska Pipeline.

Pickard acknowledges that if 2030 oil prices are no higher than today's, all the effort will have been for naught. If prices are 40 percent higher, or $70 a barrel, Chukchi oil would be "competitive," she says. At $110, which the company sees as a realistic possibility, it would be a smashing success. The vicissitudes of petroleum pricing aren't Pickard's concern right now. A Norwegian oil regulator she's friendly with reminded her recently that if Shell makes progress, other companies and nations will be emboldened to try the Arctic. "A lot's riding on your performance," the Norwegian told her. "The world's watching you." Ⓑ

D ITSELF THAT RENEWABLE ENERGY CAN'T TO MEET GROWING ENERGY DEMAND"

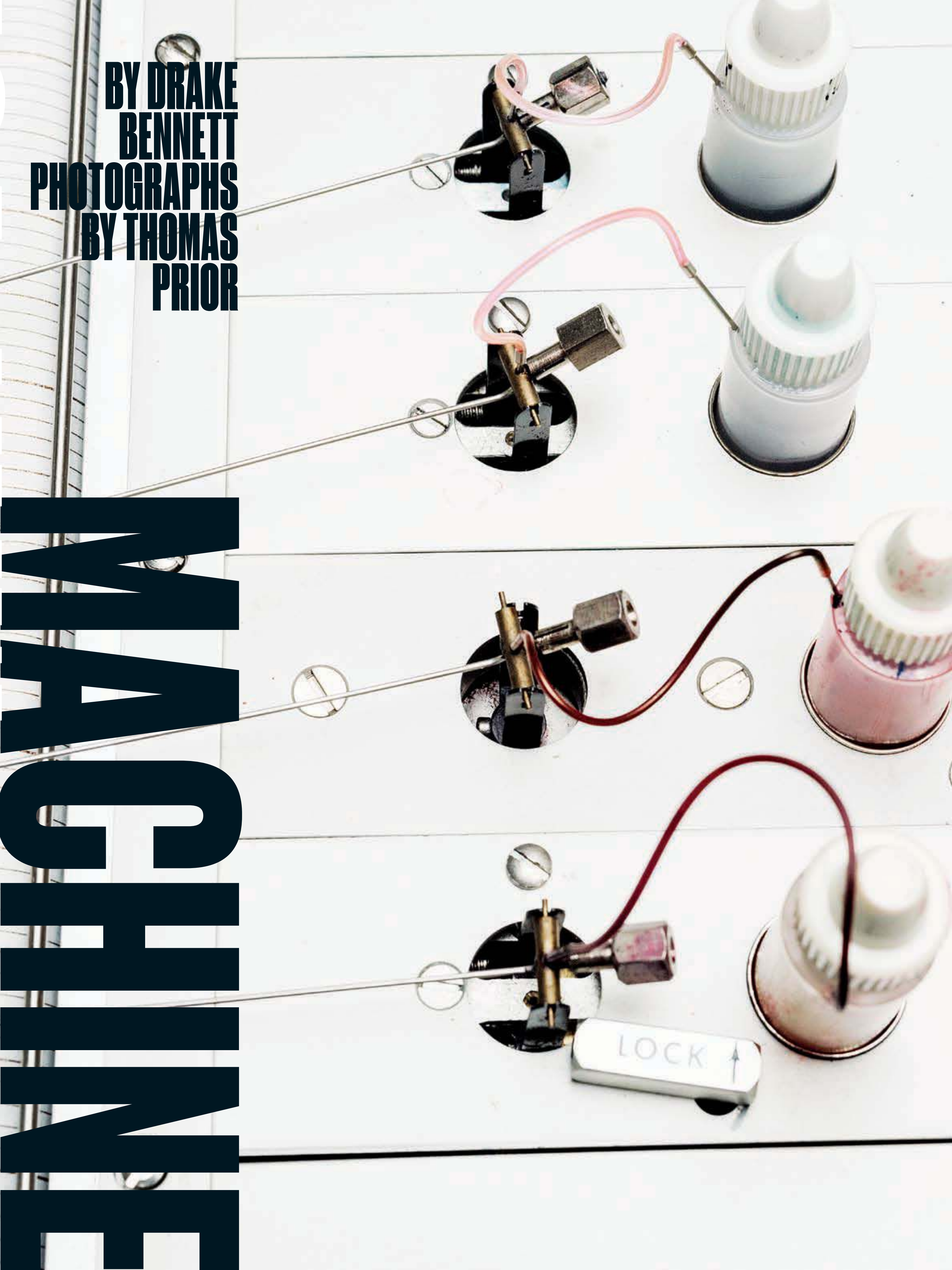
Protesters near the *Polar Pioneer*; "kayaktivists"; blocking the *Fennica*

MAN VS.

THE TRUE STORY OF AN EX-COP'S WAR ON LIE DETECTORS

MACHINE

BY DRAKE BENNETT
PHOTOGRAPHS BY THOMAS PRIOR



There was something odd, Doug Williams recalls, about the clean-cut young man who came to see him on Feb. 21, 2013. When Brian Luley had called two weeks earlier, he'd introduced himself as a deputy sheriff in Virginia applying for a job with U.S. Customs and Border Protection. To get the job, Luley needed to pass a polygraph test, and there were "a couple of reasons" he thought that might be a problem.

"I will get you ready," Williams had promised. A former police detective and a man congenitally unencumbered by doubt, he claimed he'd already helped thousands of people beat the polygraph. In pictures on his website, polygraph.com, the goateed 67-year-old sat at a desk in a suit with his hands clasped, his silver hair slicked back from a tanned and furrowed brow. "Nervous or not, lying or not, no matter what," he assured his clients, they would pass. The site had a manual and an instructional DVD for purchase, but if you really wanted to be sure, Williams would teach you one-on-one. Luley wanted to be sure.

Many of the people who sought out Williams over the years had secrets: marital indiscretions or professional lapses, drug busts or sex crimes. Williams never asked for details—those weren't his concern. He has no affection for crooked cops or sexual predators, but what he hates above all else is the polygraph machine, an "insidious Orwellian instrument of torture," as he calls it, that sows fear and mistrust, ruining careers by tarring truthful people as liars. "It is no more accurate than the toss of a coin," he likes to say. When he's feeling less generous, he'll say a coin works better.

Williams's office was a small basement room next to a massage studio in Norman, Okla. When Luley arrived, he didn't act like other clients. He didn't seem nervous, and he barely looked at the machine on Williams's desk—an Axciton five-channel sensor box with blood pressure cuff, finger electrodes, motion-sensor pad, and two pneumographs to measure breathing. Williams described how a typical examiner would monitor Luley's breathing, blood pressure, heart rate, and sweating. The examiner would ask "control" questions, assuming Luley would answer dishonestly—"Have you ever lied to anyone in authority to keep from getting in trouble?"—along with the questions the examiner really wanted answers to: whether Luley had committed and not disclosed serious crimes. The "controls" are intended to reveal a subject's response to telling a lie; if Luley's reaction to the relevant questions was stronger than his reaction to the controls, he'd be judged to be deceptive. The trick, Williams explained as he strapped the sensors onto his client, was to exaggerate the reaction to the controls and minimize the reaction to the "relevants."

Little of this, however, appeared to get through. Luley displayed a striking compulsion for detailed self-incrimination. "If I tell them that I sold drugs in the jail when I was a jailer, can they use that against me?" he asked at one point. He also mentioned that he'd "messed around" sexually with a 14-year-old drug suspect after interviewing her.

"Keep that s--- to yourself," Williams snapped, unaware that he was being surreptitiously filmed. "I mean, why would you ever say something like that anyway? If you're gonna do that, save yourself the trouble. Don't even go, if you're going to sabotage your own damn self."

Nonetheless, by the end of the session, Luley was able to produce what Williams judged to be a truthful, if not exemplary, polygraph "chart." It was with some relief that Williams saw the young man out the door. Then the federal agents who had been waiting outside burst in.

The quest to defeat lying is as old as humanity. In Bronze Age China and India, suspects had to chew uncooked rice and spit it out to reveal if their mouths were dry. Medieval Europe had trial by fire or water. In the 1950s and '60s, the CIA experimented with LSD as a truth serum. Then there's torture, formalized in ancient Greece as a method to compel honesty and recast for the 21st century as "enhanced interrogation."

The polygraph, invented in 1921, is today's most widely trusted lie-detection device. It's used to determine who gets hired by the CIA, the FBI, the Drug Enforcement Administration, and police departments all over the country. It helps decide who gets security clearances. Police detectives use it as an investigative tool, intelligence officers use it to assess the credibility of sources, and exams are commonly required as a condition of parole and probation for sex offenders.

This reliance continues despite the lack of scientific agreement about how well—or even whether—the polygraph works. Defenders point to studies that show a 90 percent accuracy rate. The National Academy of Sciences, however, in a 2002 report, found a "lack of understanding of the processes that underlie polygraph responses" and concluded that the quality of polygraph research "falls far short of what is desirable." These criticisms, according to many psychologists, remain true. Some of the nation's most notorious spies, including Aldrich Ames and Ana Montes, passed polygraphs. In a 1998 Supreme Court decision, Justice Clarence Thomas wrote, "There is simply no consensus that polygraph evidence is reliable," and most judges have agreed.

For three and a half decades the polygraph has had no critic more dedicated or more obstreperous than Williams. He's been a White House aide, a private investigator, a construction worker, and a member of the clergy. In the 1980s he was a barnstorming activist living out of a truck, giving talks and training sessions, going on talk radio and TV, testifying in courtrooms and before Congress. He eventually settled down and began charging for his instructional materials and tutoring. Over the past few years he's learned, painfully, what can happen when an obsession becomes a business—especially

"WE DON'T KNOW HOW MANY GOOD PEOPLE WE LOSE, AND WE DON'T KNOW HOW MANY BAD PEOPLE HAVE GOTTEN THROUGH"

when that business is spreading detailed information about a law enforcement technology that works best when its subjects know only what they're told.

The first time Williams saw a polygraph was in 1966, after his sophomore year at Bethany Nazarene College, when he left the small Christian school outside Oklahoma City to enlist in the Air Force. High scores on his aptitude tests got him sent not to Vietnam but to Washington, to serve in the White House Communications Agency. The last requirement for getting the posting was an appointment with the machine.

For two and a half years, he sent and received encrypted messages from the White House Situation Room, earning letters of commendation from military and civilian superiors. It was a heady but ultimately disenchanting experience. "The intelligence community was just a web of intrigue and paranoia," he says. "Ninety-nine percent of the s--- that's classified should never be classified. Really what it's all about is to cover up corruption and ineptness and outright fraud."

Williams is sitting at the kitchen table of the single-story orange-brick house in Norman he shares with Kathy, his wife of 18 years. It's early May, a week before the start of his trial in federal court. When I ask if he has any mementos from his White House tour, he goes into his study, a blast zone of papers and boxes, and eventually returns with a goodbye card signed by Henry Kissinger.

When his deployment was up, Williams returned to Oklahoma City and got a job as a police officer. Chris Eulberg joined the force the same year, and the two remain close friends. As a patrolman, Eulberg recalls, Williams got his picture in the local newspaper for single-handedly apprehending an armed robber. He also infuriated his fellow officers by reporting one of them for stealing a TV while investigating a break-in. In his off hours, Williams took psychology and criminology classes at Oklahoma City University.

One day in 1972 he saw a job posting for a polygraph examiner at sergeant's pay, a significant bump up for him. He applied, got accepted, and was sent for a three-month course in New York. To his surprise, the bulk of the training focused on interrogation techniques. Many of the confessions Williams would elicit, the instructor explained, wouldn't be during the test itself, but in the pretest interview. Subjects, certain they were about to be exposed, would simply break down. The trick was to take advantage of that.

For seven years, Williams ran polygraph exams for his department's internal affairs bureau. Off duty, he freelanced for local businesses. At the time, store clerks, bank tellers, route salesmen, and other workers who handled cash were regularly polygraphed. If money or equipment went missing, the boss would often call in a polygrapher to question the staff. By some estimates, Americans underwent more than a million exams a year.

The argument for the polygraph has always been that it's the best tool available for a difficult task. The device may not be infallible, its proponents concede, but humans are far more fallible: Even trained interrogators, studies suggest, are barely better than chance at spotting a liar. David Raskin is perhaps the leading pro-polygraph researcher. A psychologist and University of Utah professor, now retired, he helped develop the modern computerized polygraph. "Properly administered and interpreted," he says, the exams are more accurate "than virtually any psychological test used as evidence in court—and better than a large number of the medical tests used as evidence, too."

As an examiner, Williams saw the polygraph simply as a prop to scare confessions out of suspects, "a psychological billy club." And over time, he came to believe that a properly trained subject could game the machine. The key realization occurred when a friend on the force came into the station describing a high-speed chase from the night before. With all the fear and adrenaline, he told Williams, the "pucker factor" had been high—he'd been "pinching doughnuts" out of the seat of his

Williams's 1984 Stoelting polygraph

patrol car. That vivid image made Williams wonder if the same process could run in reverse, if an intentional "pucker" could trigger the physiological stress responses a polygraph traced. That would allow a subject to manipulate his response to the control questions and rig the test. For a lark, Williams hooked himself up to the machine in his office and clenched. "Lo and behold," he recalls, "the most beautiful blood pressure increase you ever saw, accompanied by a corresponding increase in sweat activity in my hand." The effect was even more convincing if he simultaneously altered his breathing pattern to fool the pneumographs.

About that time, Williams realized his job was destroying his life. "The thing about interrogation—you know, fear has a smell," he says. "That smell would greet me in the morning, lingering in my office from the previous day. And it would be compounded day after day after day." Hooking his subjects up to his machine to measure their blood pressure, his own would climb into dangerous territory. He took to drinking a nightly pint of whiskey, usually alone—as an internal affairs investigator, he had become a pariah in the department. In 1979, miserable and exhausted, he quit.

For more than a year, Williams drifted. He lived for a little while with his parents in Houston, where his father was a Methodist pastor. Moving back to Oklahoma City, he did investigative work for Eulberg, who'd left the force to practice law. He learned carpentry. One day, his sister told him she needed to take a polygraph for a job at a nightclub. Williams said she should prepare, that innocent people can fail the test just from nerves. He wrote up a set of instructions, and after she passed, her co-workers started asking for copies. Williams, with a clergyman for a father, had been raised to believe in the idea of a calling. He decided he'd found his. "It just kind of took over his life," Eulberg says. "He decided that he had hurt people as a polygraph operator, and so he started this crusade."

Williams bought a white 1967 Chevrolet panel truck and installed a fold-down bed in the back, along with a portable toilet, a hot plate, and a makeshift desk. For the next five years he drove around Texas and Oklahoma, sleeping at the building sites where he found carpentry work. After work and on weekends he'd present himself at union offices and churches to speak about the psychological billy club. He took his Stoelting polygraph, with its skittering ink needles and scrolling graph paper, and offered to show people how to beat it. The machine, he'd say, was effective only as a way to browbeat confessions out of subjects, whether they were true or not. He pestered radio bookers and TV producers over the phone and by mail, and he made a point of befriending clerks at convenience stores, so he could ask them to answer the pay phones there and pretend to be his answering service. They were usually happy to help—many had been polygraphed by their employers. "You talk about the spectrum of people who were at one time distributing my manuals," Williams recalls. "They ranged from the American Civil Liberties Union on one end to the John Birch Society on the other."

In the small world of polygraph examiners and antipolygraph activists, Williams became a celebrity. On July 30, 1985, he testified before a House Education and Labor subcommittee about a bill to ban employment-related polygraph testing. "My name is Douglas Gene Williams, and I plead guilty to crimes against humanity," he announced to the assembled members of Congress. He appeared in a *60 Minutes* segment with Diane Sawyer in 1986, helping the show orchestrate an elaborate setup. The producers brought three real-life polygraphers to a magazine office and told them a camera had been stolen. The polygraphers, thinking the crime was real, were told that one employee—a different person for each examiner—was the likely culprit. Each confirmed that, yes, their particular "suspect" was lying about being innocent.

The study in Williams's Oklahoma home

At this point, Williams was no longer living out of his truck. His father had helped him get a job as a student pastor in the town of Fargo, Okla. He'd preach on Sundays and officiate at weddings and funerals. Otherwise, he was free to use his small church office and ecclesiastical gravitas to wage war on the polygraph.

In 1988, Congress passed, and President Reagan signed, the Employee Polygraph Protection Act, which forbade testing in the private-sector workplace. Liberals and conservatives alike had pushed for the bill: Orrin Hatch (R-Utah) and Edward Kennedy (D-Mass.) authored the Senate version. There were a few exemptions—armored car companies, for example—but not enough to sustain the industry of small businesses that had grown up to provide testing. Most went out of business.

It was a resounding victory—for unions and civil liberties organizations, for psychologists who questioned the machine's validity, for lawyers whose clients had been fired or imprisoned because of it. And, Williams ambitiously argues, for him. "Why did that legislation finally succeed?" asks the prologue to his self-published memoir, *From Cop to Crusader*. "Many say it was primarily due to the efforts of Doug Williams." Feeling he'd earned a sabbatical, he resigned his pastorship, bought a motor home, and drove down to Galveston, Texas. Parking on the beach, he built himself a deck and lived there for seven years, working odd jobs when he periodically ran out of money for food and beer.

As the polygraph disappeared from businesses, though, the government was coming to rely on it more. In the wake of the Aldrich Ames disaster in 1994, the CIA toughened its polygraph testing. The FBI dramatically expanded its testing in 2001 after agent Robert Hanssen was also outed as a Russian spy. In 2010, Congress passed a law requiring all applicants for law enforcement jobs with Customs and Border Protection (CBP) to take the test.

The psychologist Charles Honts has, with Raskin, done many of the studies that polygraph advocates cite. A Boise State University professor and former U.S. Department of Defense polygraph instructor and researcher, he takes issue with the widely cited National Academy of Sciences finding that most polygraph research is plagued by methodological problems. Yet the way the federal government uses the test, he says, "causes me discomfort."

The test works best, Honts argues, when the questions are about specific events. Job screening questions, however, tend to be broad: "Have you committed serious crimes that went undiscovered?" or "Have you had unauthorized contact with a foreign national?" The difficulty is compounded, he says, in looking for spies or aspiring Edward Snowdens. "There are hundreds of thousands of people who work in the federal government who need security clearance," he says. "How many people working for foreign governments apply for those jobs? If you're looking for something that only occurs one-tenth of 1 percent of

the time, running a test that's 90 percent accurate doesn't help you." Depending on where you set your threshold, you either miss most of the spies or you cast suspicion on tens of thousands of innocent people. Sometimes you do both.

"We don't know how many good people we lose, and we don't know how many bad people have gotten through and haven't gotten caught," Honts says. "And we don't know whether the polygraph is at all predictive of either of those outcomes."

Williams doesn't like the term "polygraph countermeasures." He believes it implies that the polygraph is inaccurate only when people are trying to fool it. Instead, he teaches people to "sting" the device, to trick the examiner the way undercover cops trick their quarry. Over the years, as examiners adapted their methods, he adapted his, too. He no longer teaches the pucker—polygraphs now have a seat pad to catch it—opting instead for mental visualization techniques.

"FRANKLY, JAVIER, I SMELL A RAT ... DO NOT SEND THE MONEY—DO NOT MAKE THE RESERVATIONS—I AM NOT GOING TO HELP YOU!!!!"

In 1996, soon after Williams tired of life as a middle-aged beach bum and moved back to Oklahoma, he built a website and started charging $47.95 for digital downloads of his manual, at the time still an exotic technological process. Several years ago, he added private lessons: $1,000 if clients came to his office, $5,000 if he had to travel to them. That, and Kathy's income as a real estate agent, allowed him to acquire some of the trappings of affluence—a Mercedes-Benz SUV, a vintage gold Rolex (bought on EBay), and a kitted-out Harley-Davidson he'd ride therapeutically at high speeds on the interstate.

He had competition. There was Polygraph Consultants of America, started by (and solely consisting of) Indiana electrical contractor Chad Dixon, who'd read Williams's manual. Russell Ehlers, a small-town Wisconsin police chief, has offered online instruction on passing a pre-employment test. A book by activists George Maschke and Gino Scalabrini, available for free on their website, describes exam countermeasures such as controlled breathing, mental arithmetic, and biting one's tongue.

Williams, though, claimed to be the best: a certified polygraph examiner and expert interrogator with a decadeslong track record of successfully training people. The anonymity of Williams's clientele makes it impossible to independently evaluate that track record, of course, but he guaranteed to one-on-one students that they'd produce three perfect truthful charts by the end of their lesson. "It is a proven fact that Doug Williams can teach you how to pass any polygraph test, given by anyone, for anything, anytime," his website read. It was only natural that when federal investigators declared war on polygraph countermeasures, he became a target.

On Oct. 15, 2012, Williams got a call from a man named Javier Domingo Castillo. He told Williams he was a Department of Homeland Security inspector who'd helped a friend smuggle cocaine into the country. The friend got caught and confessed, and as part of the resulting investigation, Castillo was being polygraphed. He was concerned enough that he wanted Williams's top-shelf option: $4,500 (after some bargaining), plus the cost of a first-class ticket and a hotel suite, for Williams to come to Virginia.

In reality, Castillo was an undercover investigator with CBP's Office of Internal Affairs, and the sting he set in motion was part of a larger countermeasures crackdown called Operation Lie Busters. It's perhaps surprising that Williams—a former internal affairs detective who named his polygraph-beating technique the "sting"—would fall for such a trap. What's even more surprising is that, before he did, he saw through it.

"Frankly, Javier, I SMELL A RAT," Williams e-mailed on Oct. 17. "You are doing what I told you not to do, and that is telling me that you are lying. ... DO NOT SEND THE MONEY—DO NOT MAKE THE RESERVATIONS—I AM NOT GOING TO HELP YOU!!!!" When Castillo called Williams to ask him to reconsider, Williams angrily rebuffed him: "Either you're an agent trying to set me up or an idiot. I ain't working with either one of those guys." But in recordings later played in court, Castillo's repeated pleas softened Williams somewhat. He hung up saying he'd think about it.

At that point, according to trial testimony by Douglas Robbins, the CBP agent in charge of the investigation, there were no plans to reach back out to Williams. The investigation was dead in the water, or would have been, had Williams himself not revived it less than two hours later. Castillo received an e-mail from theparanoidchicken@hotmail.com, an address he hadn't seen before, offering a workaround. "If I get a call from a number that I don't know," it read, "and an e-mail from a person I don't know, with a name I have never heard of, I could work with that person, especially if he is telling the truth and is just nervous because he knows it doesn't work."

The deal was back on. Castillo called Williams, who asked jocularly if the agent had heard from the paranoid chicken. Warming to Castillo further, Williams decided they didn't need to bother with the fake e-mail and phone number. "You're just a desperate man in need of help, am I right?" Williams asked. Castillo said he was.

On Oct. 27, two days early to avoid Hurricane Sandy, Williams flew to Washington. At a hotel in Alexandria, Va., while investigators listened from the next room, he gave Castillo an hour-and-a-half lesson. He explained the difference between relevant and control questions

A digital polygraph chart

on the second day of the trial, accompanied by her adult daughter, who wept steadily.

Midway through that day, Williams decided to plead guilty to all five counts. The jury had heard the Castillo recordings but had not seen the Luley video, with the undercover agent's references to sex with a 14-year-old girl. Standing before the judge and speaking in a chastened voice, Williams read the plea aloud.

While it's not always prosecuted, it's a crime to knowingly help someone lie to a federal agent. In December 2012, Dixon, of Polygraph Consultants of America, pleaded guilty to charges similar to Williams's; he was sentenced to eight months in prison. Training someone is different in the eyes of the First Amendment from writing a book or a blog post describing countermeasures, acts that have a broader civic purpose. "If there's a bad use and a good use, then the speech is protected," says Eugene Volokh, a law professor at the University of California at Los Angeles. "It's hard to really think through whether polygraphs are a good idea without having a sense of whether they're easily defeatable. But once you get this one-on-one interaction with somebody whose purposes you know, then it stops being dual-use and becomes only single-use. This person is not going to be making policy about polygraph examinations—this guy wants to defraud somebody."

Still, using criminal prosecution to prevent people from learning how to fool a test doesn't suggest great confidence in that test's diagnostic power. And Operation Lie Busters can't bust the Internet, which has a wealth of information on countermeasures—some of it anecdotal and anonymous, some of it peer-reviewed research. Mark Zaid, an attorney who represents federal law enforcement and intelligence employees, says he's seen a sharp uptick in clients being denied jobs and clearances because they're accused of trying to beat the exam. "It's out of control," he says. The easier the information is to find, he argues, the more paranoid polygraph examiners become.

and went through the hypnosis script he used to get his students to relax when asked relevants. Castillo was to imagine being on a beach. "Wave after wave, gently rolling into the shore," Williams repeated softly in his Oklahoma twang. Then he had Castillo think of something frightening to call to mind to spike his breathing, sweating, blood pressure, and heart rate when asked a control question. He went over potential questions Castillo might be asked and ran the agent through his practice tests, complimenting him on his performance. Then they were done. After Williams got back to Oklahoma City, he tweeted, "Another person is now confident and prepared to pass their polygraph test."

Four months later, Williams trained CBP Special Agent Luley, the supposed Virginia sheriff's deputy, and found himself being served with search warrants for his office and home.

On May 12, Williams went on trial in Oklahoma City's federal courthouse. For training Castillo and Luley, he was charged with two counts of mail fraud and three counts of witness tampering, each charge carrying a maximum sentence of 20 years and a $250,000 fine. Two young lawyers from the Department of Justice's Public Integrity Section flew from Washington to prosecute him. In the mostly empty gallery were CBP agents, lawyers, and the antipolygraph activist Maschke. A soft-spoken former U.S. Army intelligence officer, Maschke had traveled from The Hague, in the Netherlands, where he works as a translator. He wore a pin that said "I know the lie behind the lie detector" until the judge noticed it and asked him to keep it in his pocket while in her courtroom. Kathy Williams came

Companies are working to bring new types of lie detectors to the market—and, they hope, to the courtroom. Some use electroencephalography or functional magnetic resonance imaging to trace brain activity; a startup called Converus has developed an exam based on eye movement and pupil dilation. Raskin, the polygraph researcher, is on the company's science team. Focusing for now on Latin America, Converus markets its "pre-employment and periodic employee screening solution" to government agencies and the sorts of businesses that in the U.S. have long been forbidden from using the polygraph.

Williams's website is still online. Immediately after his guilty plea, he took it down, but a few weeks later, mercurial as ever, he reversed himself and put up a stripped-down version. "It's my way of saying, look, you know, this is what I have done for 35 years," he explains.

Sentencing could come as early as the end of summer, shortly before Williams turns 70. In the meantime, he studies the Bible, prays, watches TV, and occasionally takes a ride on his Harley. He's been having panic attacks, and he was recently diagnosed with chronic obstructive pulmonary disease. Speaking on the phone from his house two months after his plea, he's uncharacteristically subdued. He still rolls out the well-practiced applause lines and the old epithets for his Orwellian nemesis, but he can't muster the same motivational anger. "It's a lot easier to pick a fight when you're 35," he says, "than to finish it when you're 70." B

How Long Can Condé Nast Pretend It Has Nothing to Do With the Weirdest Place on the Internet?

By Felix Gillette and Gerry Smith
Photograph by Steven Brahms

Can't Run Anything

In 2006, Condé Nast, the New York-based publisher of *Vogue* and the *New Yorker*, among other magazines, bought a promising information-sharing and online-discussion startup called Reddit. At the time, social media was just taking off and big media conglomerates were scrambling for a piece of the action. Rupert Murdoch's News Corp. had recently outfoxed Sumner Redstone's Viacom to acquire Myspace for $580 million. In a seller's market, Condé Nast managed to pick up Reddit for a reported $20 million. The site worked out of the same offices in San Francisco as another Condé title, *Wired*. Things were chummy. The corporate parent back East was extremely hands-off, and Reddit's community of users—Redditors—grew to the millions. For a time, as Myspace imploded and Reddit turned into the town hall of the digital era, Condé Nast looked like a bunch of geniuses.

Today, after much executive turnover and countless incidents of questionable Redditor behavior, Condé Nast and its titles would prefer you not think of Reddit as theirs. *Wired*, in a somewhat strained blog post on July 28, explained its "complicated" relationship to its onetime officemate: "[W]e want to clear something up: we aren't related to the site." Such family disavowals tend to take place under dramatic circumstances—perhaps in the wake of a messy divorce or at the end of a particularly drunken Thanksgiving. Or, in this case, after a nine-year case study in the hazards of absentee management.

On first encounter, Reddit is baffling. The site is a hodgepodge of links, snapshots, and news clippings, unspooling in rows of blue text with all the aesthetic seduction of a phone book. On a recent Friday afternoon, the front page featured a disorienting mix of items. A link to a news story about the effectiveness of an Ebola vaccine in a trial in Guinea appeared above a photo essay about constructing a giant table from discarded wood. Nothing about the site suggests it's a popular destination. Yet it is. According to ComScore, Reddit attracted 31.5 million unique visitors in the U.S. in June, putting it on par with the *Guardian*, Dailymotion, and ABC Digital. (Reddit's own figures put the audience at 164 million monthly users.) Last year, Reddit raised $50 million in a round of funding that valued the company at $500 million.

In the online ecosystem, which sucks up social media posts, cat pics, and small-town news bulletins and extrudes them as viral sensations, Reddit plays a vital role. Its thousands of topic-specific message boards, known as subreddits, form a map of the collective interests of the Internet-browsing public.

The site is built on anonymity. No e-mail address is needed to sign up, and Redditors interact using pseudonyms and avatars. Publicly outing another user's real-life identity is a grave and punishable offense. Anonymity and the Internet, of course, are a combustible mix, and Reddit has become the primary vortex of Internet rage. There have been subreddits dedicated not only to white supremacy but also to "creepshots" (prurient photos taken of women and girls without their knowledge), "fat shaming," and graphic images of victims of domestic violence. In the wake of the Boston Marathon bombings, Redditors, combing through surveillance photos, publicly identified and wrongly accused multiple young men of being the attackers. On Aug. 5, as part of a stricter content policy, Reddit said it would be "quarantining" certain offensive subreddits, making the communities largely invisible to nonparticipants. It also banned several subreddits, including ones about racism and animated child pornography.

In the past, any effort to rein in the more odious subreddits has been met with fierce Redditor resistance and shouted down as unwarranted censorship of free speech. In July, Chief Executive Officer Ellen Pao resigned in a firestorm after attempting to impose seemingly minor changes on the business. Pao's struggles had little to do with her leadership abilities: Reddit has evolved into one of the least manageable media properties of the Internet era.

How that came to be can be traced back to Condé Nast. Over the years, many big media companies have acquired promising startups only to inadvertently throttle their growth through excessive meddling. It's what happened, for example, to Myspace under Murdoch. Condé Nast's original policy of noninterference allowed Reddit to flourish early on, but it also let major problems fester. The company declined to share any current financial data. In 2013 it published a chart tracking expenses vs. revenue—with the specific numbers removed "to thwart would-be Wall Street analysts"—which showed that while revenue had increased over the past year, the business was still losing money.

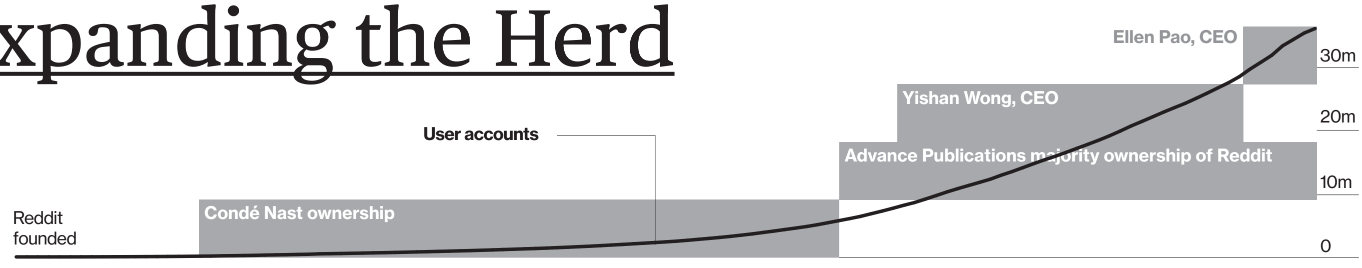
Advance Publications, the private company that owns Condé Nast, is still the majority owner of Reddit, but you'd never know it from reading news coverage. "Their strategy," says Robert Quigley, who teaches new media at the University of Texas at Austin, "appears to be to pretend they don't own it."

Reddit was founded in 2005 by a pair of new University of Virginia graduates, Alexis Ohanian and Steve Huffman. From the start the college buddies envisioned the site as a place where anyone could share links and participate in conversations, "upvoting" submissions to prominence or "downvoting" them into obscurity. Through a Reddit spokesperson, Ohanian and Huffman declined interview requests.

In early 2006 the co-founders were living together in Somerville, Mass., struggling to keep Reddit alive. They had a growing audience, a shrinking bank account, and no way of generating revenue, according to an account in Ohanian's 2013 book, *Without Their Permission*. In March, less than a year after starting Reddit, Ohanian received an e-mail from Kourosh Karimkhany, a former business-development executive at Condé Nast. Karimkhany said he'd heard about the site from a friend of his wife's.

Seven months later, Condé Nast acquired Reddit, outmaneuvering other potential buyers, including Google. The deal was part of a broader slate of acquisitions, which included wired.com (Condé Nast already owned the magazine) and the tech news website Ars Technica. The moves were designed to build an audience of young, tech-oriented males to entice digital advertisers.

Expanding the Herd



DATA: REDDIT; PREVIOUS PAGE, SET DESIGN: DAVE BRYANT

Reddit and Condé Nast made an odd pairing. Condé is famous for its rarefied class of editors—Anna Wintour at *Vogue*, David Remnick at the *New Yorker*, Graydon Carter at *Vanity Fair*—who lead hierarchical teams that create polished stories alongside lavish advertisements for paying readers. Reddit is a house of commoners, dedicated to the ideals of open discourse and peer-to-peer learning, and it's hostile to many of the things Condé Nast represents. Opulence. Exclusivity. Advertisers. "The Internet is a democratic network where all links are created equal," Ohanian wrote in *Without Their Permission*. "And when such networks get hierarchies forced on them, they break. They start looking a lot more like the gatekeepers and bureaucracies that stifle great ideas and people in the physical world."

The acquisition was led by Steven Newhouse. He's the scion of the family dynasty that owns Advance Publications—the sprawling, privately held media company that, in addition to Condé Nast, owns a portfolio of newspapers, local cable television providers, and food and lifestyle websites. Thomas Maier, the author of a 1994 biography of the Newhouse family, says that Steven, now 58, is considered the future king of the empire. "If the company does continue, he's the obvious person in the next generation to take it over," agrees Steve Cohn, editor-in-chief of the *Media Industry Newsletter*. Newhouse turned down an interview request.

During the courtship of Reddit, a former Condé Nast executive says, the company promised that if the deal went through, it would leave the founders alone to run the site with minimal interference. After the acquisition, Reddit's small team relocated to *Wired* magazine's offices in San Francisco, a continent away from Condé Nast's headquarters in Manhattan. "We did almost nothing to integrate Reddit into the rest of the company, and we probably should have done even less," Bob Sauerberg, Condé Nast's president and a current Reddit board member, told *Forbes* in 2012. "We left Reddit in San Francisco and let it find its own way. Mostly we wanted to make sure we didn't screw it up." Sauerberg did not respond to an interview request.

"I think that it's important when looking at a company like Reddit, which is an incredibly high-growth company, not to impose a business model until it evolves organically," Newhouse told digitalriptide.org in 2013.

Reddit's small team enjoyed being left alone. "They were supergreat in terms of being hands-off," says Jeremy Edberg, an early Reddit employee. "They didn't try to make a bunch of changes. They just said, 'Go do your thing.'"

Ohanian, Huffman, and the team took their time figuring out how to make money. Eventually they turned to advertising, albeit with ambivalence. "We realize users often have animosity towards ads, but they are a fact of life on the web," Huffman wrote on Reddit's blog in 2009. He went on to introduce "sponsored links," ads that would look much like a typical Reddit submission, only shown with a different-colored background and labeled as paid content. Huffman tagged the announcement with several keyword phrases, including "mo money mo problems," and "sell outs."

Advertisers could buy the sponsored links using Reddit's newly constructed, self-serve ad platform. All you needed to get started was a valid U.S. credit card. The minimum buy-in was $20. In deference to the outsize importance that Redditors place on privacy, the platform gathered little data. "Reddit has philosophical beliefs about how users' privacy should be treated," says Keith Mitchell, a former employee. "To respect those beliefs, they had to build their own systems that would do less tracking of users. That, of course, made it less appealing to many advertisers."

Without demographic information to offer, Reddit told marketers it could still reach particular segments. A shampoo brand couldn't target, say, 18- to 34-year-old women; but it could

Ohanian

Pao

OHANIAN AND PAO: GETTY IMAGES. CATS: ALAMY (2); DEPOSIT PHOTOS (1)

post a sponsored link directly in the r/CurlyHair subreddit. "If you go to a paintball subreddit, paintball companies can advertise to you," says Sam Altman, a Reddit investor and board member. "The users are anonymous, but they are seeking out the things they are interested in. The nice thing about Reddit is, we don't have to sell your data or build a profile of you or do stuff that makes people feel uncomfortable."

Major advertisers were slow to materialize. The community's generally stickin'-it-to-the-man attitude didn't help. In 2009 a user figured out how to hack into the Sears website and showed other Redditors how to do so. The hackers proceeded to tweak various product descriptions on Sears's website, changing the description of one item, for example, into a grill "to cook babies." Sears was not amused; Condé Nast ordered Reddit's team to remove the post, says Mike Schiraldi, a former Reddit programmer. Huffman begrudgingly complied.

A few months later, in October 2009, when the founders' three-year contracts with Condé Nast expired, Huffman and Ohanian walked away. Huffman went on to build a travel website called Hipmunk. Ohanian gained notoriety as a Web evangelist, commandeering John McCain's former campaign tour bus, the Straight Talk Express, and traveling around the country with a hefty scroll titled the Declaration of Internet Freedom.

As the U.S. fell into recession that year, Reddit felt the pain of its corporate parent. With print advertising plummeting, Condé Nast hired McKinsey & Company to help cut costs. Compared with its famously profligate magazine siblings, Reddit ran a lean operation. Its content was generated for free; its staff consisted of a handful of engineers and a few salespeople. Nevertheless, Reddit soon felt some of the McKinsey-induced belt-tightening. At one point, amid a companywide hiring freeze, Reddit missed out on a job candidate the team desperately wanted. "That was the final straw," Schiraldi recalls.

In July 2010, Schiraldi wrote a post on the Reddit company blog under the headline "Reddit Needs Help." He suggested the site's stingy corporate overlords were starving Reddit. "We've been kinda bummed at reddit these days," he wrote. "It seems like every week something comes up that slows performance to a crawl or even leads to a total site outage. And we almost never get a chance to release new features anymore.... The bottom line is, we need more resources." He asked users to sign up for a premium membership plan, called Reddit Gold. Redditors wouldn't get much for their money other than a trophy icon to post on their user pages, he conceded. But the influx of money, he explained, would help Reddit's overwhelmed managers keep up with the site's growth.

Schiraldi says Reddit timed its pledge drive—and metaphorical middle finger to HQ—for a Friday afternoon in the summer, when Condé Nast executives head to their cedar-shingled retreats in the Hamptons. The subversive spin was perfectly calibrated to the Redditor sensibility. Subscriptions piled in. "We pulled in more revenue in a weekend than Condé Nast's sales team did all year for Reddit," Schiraldi says. These days, Reddit Gold members pay $29.99 a year. A company spokesperson declined to say how many are signed up.

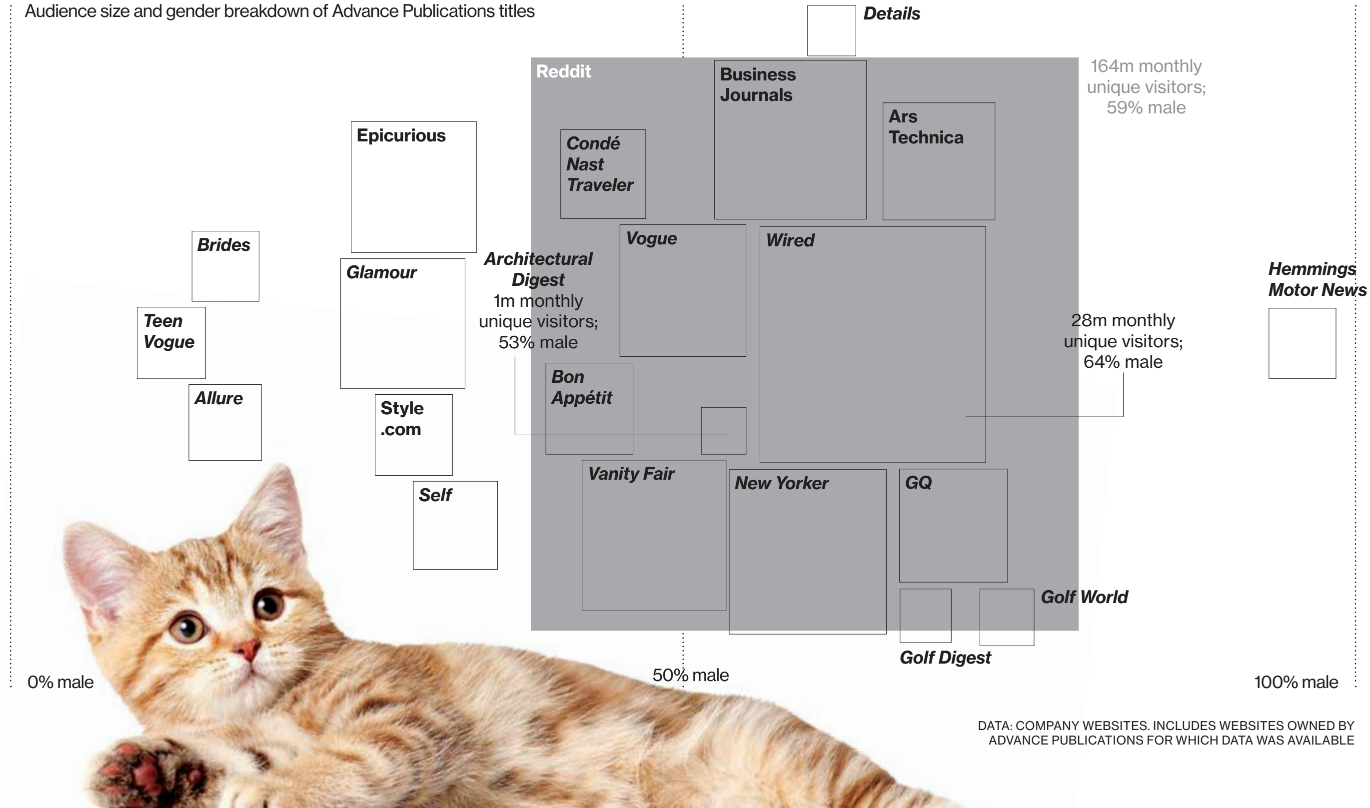
A former Condé Nast executive says that, in retrospect, one flaw with the company's hands-off approach was an assumption that Reddit's founders would know when and how to ask for help. They didn't. Prior to joining Condé Nast, neither Ohanian nor Huffman had significant experience working inside a large company. Looking back, says the former Condé executive, more hand-holding would have been a good idea.

Even without its founders, Reddit's audience kept growing. Since its inception, Reddit labored in the shadow of Digg, a similar but better-known link-sharing site. In 2010, Digg rolled out a major redesign that, to free-speech absolutists and privacy obsessives, was an affront to community self-governance and reeked of gatekeeper privilege. Droves of users abandoned the site in favor of Reddit, an exodus that became known as "the Great Digg Migration."

As Reddit's size ballooned, some of the site's more unsavory aspects started to gain media attention. In 2011, Advance

Biggest Member of the Family

Audience size and gender breakdown of Advance Publications titles



DATA: COMPANY WEBSITES. INCLUDES WEBSITES OWNED BY ADVANCE PUBLICATIONS FOR WHICH DATA WAS AVAILABLE

Publications distanced itself even further. While remaining the majority owners, the Newhouse family recapitalized Reddit, bringing in a slate of new investors and spinning off Reddit into a reincorporated entity. The move was framed as what was best for Reddit, putting the Web business on equal footing with many of its startup competitors and allowing it to entice new hires with equity offers.

Following the spinoff, David Carr, the late media columnist for the *New York Times,* wrote an assessment of Condé Nast's less-is-more management strategy for raising their *enfant terrible*. Carr noted that Newhouse was determined "that his company would not be the blob that ate Reddit." The headline: "Left Alone by Its Owner, Reddit Soars."

Advertisers remain less moonstruck. Today, instead of the site's original bidding system, advertisers buy space based on a flat fee. For more money, they can target ads to readers in specific U.S. cities or countries overseas. Even so, Reddit's offerings are limited compared with other major websites such as Facebook, where advertisers can pinpoint audiences based on myriad criteria, including age, gender, interests, location, social connections, political affiliations, and on and on. Reddit remains cut off from the centralized, automated ad markets that are increasingly important in directing advertising dollars on the Web.

Sponsored posts also have limited appeal. Unless an advertiser explicitly chooses to turn off the comments, Redditors can respond the same way they do with any other submission. They can applaud it or mock it. Reddit pitches this idea as a unique credibility-enhancing opportunity—a chance to keep it real and roll around in the mud of the Web. Advertisers, a former Reddit salesperson says, tend to see it as a chance to get torched by virtual napalm.

Huffman

Another problem, this person says, is that Reddit's massive traffic overwhelms its tiny staff. The site has billions of page-view impressions for sale each month. Any advertiser, no matter how small its budget, can pose questions or lodge complaints in a public Reddit forum. A small team of sales reps is responsible for hopping in and defusing such concerns while also providing the one-on-one service the site offers to its "large-scale advertisers," defined as anyone spending more than $30,000.

When the system works, Reddit advertisers tap into the creativity of the Reddit hive mind. Last year, Maker's Mark launched a Reddit campaign timed to the Kentucky Derby. The bourbon maker asked Redditors to submit fake, boozy-flavored racehorse names. Hundreds of Redditors responded gamely, providing suggestions like Whiskey Business, Kentucky Derpy, and Beast of Bourbon. Reddit and Maker's Mark both claimed victory.

Still, success stories like that are rare. In June, Reddit doubled the basic advertising rate on its self-service platform, jumping from 75¢ to $1.50 per thousand impressions. The price hike did not go over well. And, naturally, a handful of advertisers took to Reddit to complain. For several weeks, a company selling a $149 virtual-reality sex toy for men had been advertising on Reddit. "We're out. Sorry, Reddit," wrote the brand manager for eJaculator.com. "We're better off advertising our Adult Sex toy for men on web sites with actual targeted traffic."

Part of Reddit's way out of its predicament may simply be to heed the concerns of its most dedicated constituency: subreddit moderators. In lieu of powerful, expensive, Condé-type editors, Reddit relies on volunteers to run day-to-day operations. Although unpaid, these moderators tend to be hardworking, highly dedicated, and desperate for help. For years, they've been demanding more and better tools to do their jobs—practical things such as better search and messaging functions and ways to prevent angry users from spamming moderators' in-boxes. Such tools have been slow to appear. "They seem to take the users and moderators for granted, assuming they will continue doing what they've been doing forever," wrote Saad Lambe, a moderator of multiple subreddits such as r/thewalkingdead and r/engineering, via e-mail.

James Erwin, a Reddit moderator of several subreddits including r/history, argues that Reddit's unwillingness over the years to provide strong, hands-on leadership to the site's community is at the heart of the company's lackluster business performance. Without a firm editorial grip, the flourishing of disreputable subreddits opened the door for BuzzFeed, the *Huffington Post*, and others, which sift through Reddit content and repackage it to advertisers in more sanitized conditions. "Reddit is watching other people eat its lunch," Erwin says.

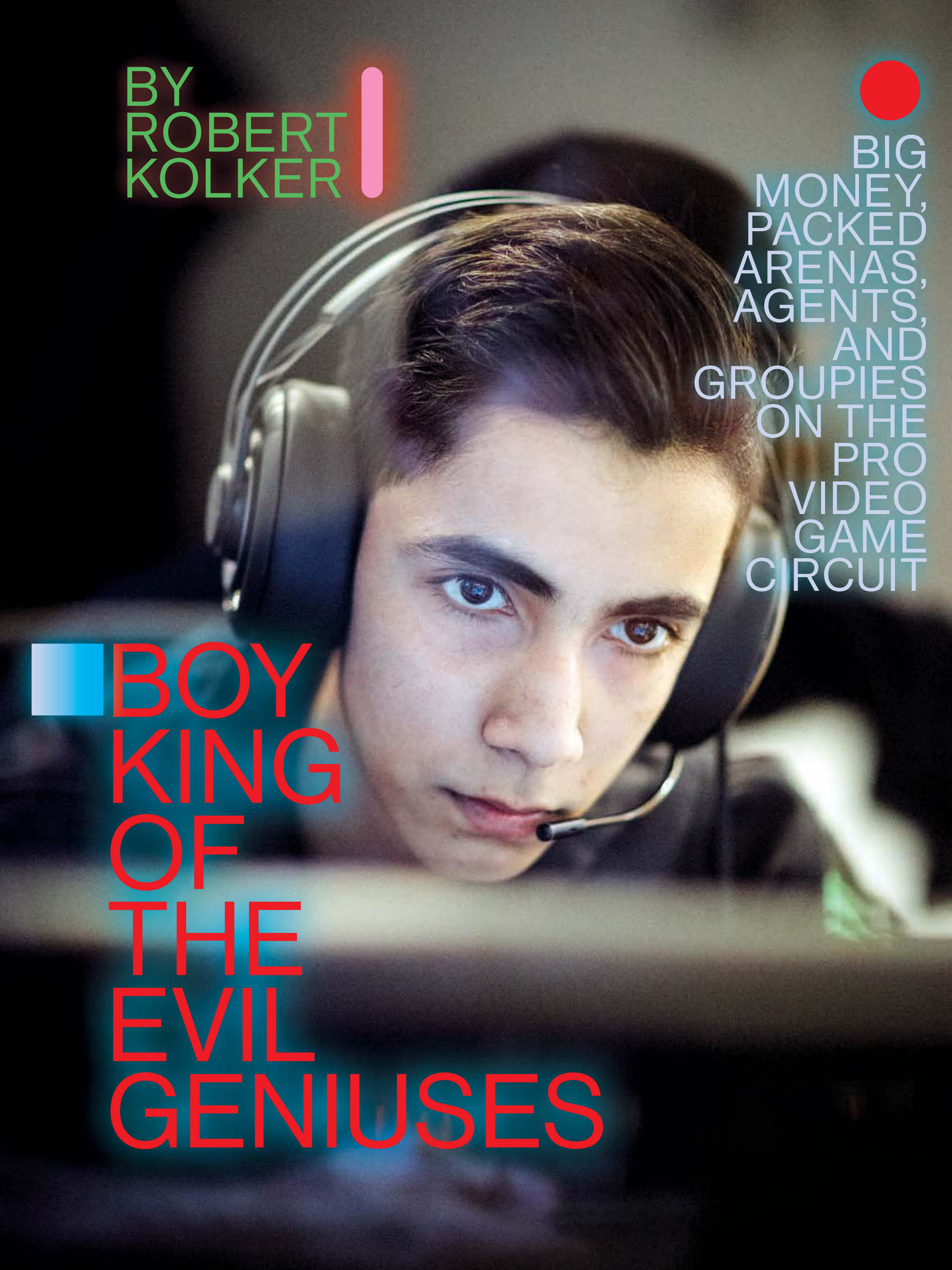
Last year, Ohanian returned to Reddit as executive chairman. In July, following Pao's resignation, Huffman returned to be CEO. Erwin, for one, says the founders are at last ready to assume the role they've always abhorred: gatekeepers. Erwin sees evidence of it already, pointing to the recent debut of *Upvoted*, a Reddit podcast delving into the site's most compelling stories. "Reddit is very much trying to establish itself as a curator of its own content and take back some of that space from BuzzFeed," Erwin says.

As for Reddit's new backers, they seem inclined for now to follow Condé Nast's example. "We ask that the company make enough money to break even, with plus or minus $5 or $10 million a year," says Altman, the Reddit investor. "Monetization is not a big focus. The company has a lot of cash in the bank."

The focus for now, he says, is product development and community growth. "Once we've figured out better moderation tools and better policies, and once we have a billion users and a robust mobile offering, then we'll sit down and talk about monetization," he says. "But now is not the time to talk about it." B

PREVIOUS PAGE: ALAMY; THIS PAGE: REDDIT (1); DREAMSTIME (1)


Bloomberg
BRIEF



BY ROBERT KOLKER

BOY KING OF THE EVIL GENIUSES

BIG MONEY, PACKED ARENAS, AGENTS, AND GROUPIES ON THE PRO VIDEO GAME CIRCUIT

In the spring of 2014, after a decade of visa problems, the Hassan family moved out of its spacious house in Karachi, Pakistan, to an apartment in Rosemont, a suburb of Chicago near O'Hare International Airport. They were a family of eight, two parents and six kids, jammed into a three-bedroom space. Money was tight and work unsteady; for most of them, the move had been a struggle. But their 15-year-old son, Sumail, was thrilled—being in the U.S. meant less lag time when he played Dota 2.

Like League of Legends and other free multiplayer online games, Dota 2 (short for Defense of the Ancients 2) rewards obsessives such as Sumail. Set in a mythical world of ogres, magicians, and "faerie" dragons, two teams of five "heroes" start on opposite corners of a square map scattered with forests and lava trenches and battle to take over the opposing team's base. The one and only goal is to secure the opposing team's "ancient"—a fountain with rejuvenating powers—before it gets yours. The gameplay moves as fast as basketball, but the complexity of characters, weapons, and spells rivals Dungeons & Dragons. Secure the "eye of Skadi" and you can slow a charging attacker to a crawl. The "shadow amulet" will make you invisible long enough to slip behind an enemy line. And for a few select players, there's more real-world money to be made at Dota 2 than any other game of its kind. The best of the best play at professional tournaments where teams compete for millions of dollars in prize money, and the most popular players can make about $1,000 just by streaming a game directly to their fans.

Sumail started playing Dota 2 as a 7-year-old. Even now, he's still small and spindly, with wide, soft eyes and toothpick arms. In Chicago, he put in minimum effort at a local public high school, making no friends and doing no homework; instead he spent all his spare time racking up impressive amateur credentials in Dota 2. While some players are all strategy, analyzing the strengths of different characters and hanging back for the right time to strike, Sumail is pure reflex and aggression—the Dota 2 equivalent of a power forward. His favorite character is Storm Spirit, a quick, evasive avatar that fires lightning balls and drops decoys that injure enemies. Simply put, Sumail kills everything in sight.

STORM SPIRIT, SUMAIL'S FAVORITE AVATAR

After a few months in the U.S., he qualified to play in a North American "in-house league," a sort of off-season competition for professional players. This was his shot, and it didn't take long for him to get noticed. In January, after Sumail slayed wave after wave of enchantresses, centaurs, and zombies, Charlie Yang, a 26-year-old Dota 2 player-turned-manager, flew to Chicago from San Francisco to visit the Hassans.

Sumail's mother, Huma, was there but not his father, Tatheer, a construction manager who had returned to Pakistan on business. Huma's English wasn't good enough to understand Yang, so Sumail's aunt and uncle helped translate. Yang said he managed Evil Geniuses, the highest-earning Dota 2 team in North America. The team would pay for Sumail to fly around the world for training and tournaments. He would earn a small stipend—less than $4,000 a month—but the real money would come from tournaments. After a 10 percent cut for the owners, prize money would be split among the team's five players. The previous year's prize pool at the game's biggest tournament, held annually in August, was more than $10 million.

Sumail's mother said yes, as long as Sumail could still go to school. "She was a little anxious," Yang says. "But I think it's hard to deny your child an opportunity like this." Yang visited Sumail's teachers next, planning out his long absences. Yang set up a bank account for Sumail and had his tax forms done. A few weeks later, in February, Sumail and his teammates—each older than him by at least five years and each a legend in the game—flew to Shanghai for the Dota 2 Asian Championships, with a prize for the winning team of $1.2 million.

The Evil Geniuses were the third seed but, with Sumail's help, made it to the finals. The opponent was a Chinese team called Vici Gaming, which had the support of the packed arena's crowd. In the first five minutes of Game 3—the last of the final—Sumail got killed four times without scoring a single kill. It was a devastating start, and the announcers said the game was basically over. But when the other team started scattering players, Sumail struck.

His avatar weakened, he shot across the field in a lightning ball and somehow scored four kills in two minutes, to the disbelief of the opposing team and the announcers commenting for the live crowd. Minutes later, he darted out of the woods to help his teammates in a skirmish and, in an explosion of fire and lightning, blasted three more enemy players to death. Before Vici could respond, Sumail rushed up the center of the map and secured the Ancient, winning the game and the tournament for Evil Geniuses. By the end, the crowd was chanting his name.

His payday after one month as a professional gamer, and just before his 16th birthday, was $200,000. By mid-August he could be a millionaire.

Cinderella stories like Sumail's are a reliable staple of e-sports. These are, after all, games anyone can play at home, and the prevalence of high-speed Internet allows practically everyone to play everyone else in the world. The promise that a player can be plucked from obscurity and win huge prize money is part of what makes e-sports so popular—so wildly and crazily popular. About 27 million people watched the final of last year's League of Legends championship, 9 million or so more than watched the San Antonio Spurs clinch a stunning Game 5 in the NBA Finals. And while many, including ESPN President John Skipper, maintain that e-sports aren't a real sport at all—"It's not a sport. It's a competition," he declared last year—that's not keeping ESPN from covering Dota 2's world championships, called the International, in August at Seattle's KeyArena, where Sumail and his team will be competing for a grand prize of more than $6 million. As Sumail put it in one of his first interviews at the Asia tournament in February: "You have to go pro or just leave it. It's a time waste if you're not going full pro. It's not for noobs."

After several false starts—remember the Cyber X Games of 2004 in Vegas? How about DirecTV and News Corp.'s Championship Gaming Series in 2007?—e-sports is finally on a roll, a $612 million global market with an audience of 134 million, according to analysis by SuperData Research. Ford, American Express, Coca-Cola, and Nissan Motor all sponsor e-sports; corporate sponsorships total $111 million in North America. An increasing number of tournaments and a pool of maturing talents, who by now have been playing games since they could walk, have transformed e-sports.

But what's really making it stick this time is live-streaming. "Having a platform available everywhere, all over the world, changed everything," says Marcus Graham, aka djWHEAT, the Bob Costas of e-sports, who hosts a program on Twitch.tv, the live-streaming platform purchased by Amazon.com last year. Thirteen percent of all live-stream viewers watch e-sports, according to SuperData, and almost half of all e-sports viewers in the U.S. use Twitch. Google plans to launch a competing service, YouTube Gaming, before the end of the summer.

On Twitch, fans can watch games and practices and

SUMAIL RUSHED UP THE CENTER AND SECURED THE ANCIENT, WINNING THE GAME AND THE TOURNAMENT. BY THE END, THE CROWD WAS CHANTING HIS NAME

E-SPORTS FANS AT MLG.TV ARENA IN COLUMBUS, OHIO

communicate directly with star players, offering an immediacy and intimacy no televised sport can match. In March the sports marketing research company Repucom reported that Twitch averaged more than 600,000 simultaneous viewers, reaching an audience of 51 million worldwide—already bigger than most American TV networks.

The big question is whether live-streaming a competitive video game will ever command the same ad rates as a TV broadcast of a game. Where the audience goes, will advertisers follow? Proof, perhaps, of e-sports' potential as a spectator sport is that 40 percent of all e-sports viewers don't play the game themselves. The tens of thousands of fans—including groupies—swarming arenas to watch tournaments, as they're expected to for August's Dota 2 International, also signify a sea change. While Valve, the Bellevue (Wash.) company that makes Dota 2, contributed $1.6 million to the International's prize money, the rest is being crowdfunded. There is no other sport whose fans directly pay the prize money.

The No. 2-ranked team going into the tournament, by most measures, is Evil Geniuses. And the No. 1? That would be Team Secret, whose star player, Artour "Arteezy" Babaev, left Evil Geniuses suddenly last December, creating the opening that allowed Sumail to make his big-time debut. Their matchup will be the one to watch. You couldn't ask for a better rivalry.

All spring, Sumail's mystique grew. He amassed 30,000 Twitter followers. He hosted his own live-streamed games, where he appeared via webcam but never spoke. Fans asked about him constantly in chats and forums: Is he Muslim? (Yes.) Does he pray to Mecca? (No, but he keeps halal, which usually means lots of cheese pizza.) Can he drive? (No.) Does he live alone on the road? (No. Yang, the manager, usually shares a room with him.)

"*Everything is based on skills*, and I'm pretty skilled," Sumail texts when I first contact him in June. He's explaining why he was so drawn to this game. "I liked the part that you couldn't win with luck only."

Does he want to go to college?

"Hehe, No."

In mid-July, I catch up with Sumail at an office in downtown San Francisco, where he and his teammates are "bootcamping," practicing for days on end. The International starts in a few weeks, and the crowdfunded prize pool is approaching $17 million. The Evil Geniuses sit in a row in front of new PCs equipped with high-performance graphics cards and processors to support elite gaming. In matching team jackets with sponsor patches, the five players look like a Nascar pit crew. But to Sumail, the other four are rock stars—players whose games he'd followed from afar until just a few months ago. "I knew every one of them because every single one of them was famous," he says. Sumail speaks passable English with a noticeable accent and limited vocabulary, often straining to find the right word.

Like Sumail, each of his teammates is, in a way, Luke Skywalker—a small-town kid who left home to embrace his destiny. Saahil Arora, known as UNiVeRsE, is 25; he dropped out of the University of Wisconsin at Madison to play and became one of the top 10 earning e-sports players worldwide last year, making $586,149, according to esportsearnings.com. Arora met his current girlfriend through e-sports; she's a fan. Peter Dager, the team captain from Indiana, known as ppd, is right behind Arora in winnings with $581,748. Kurtis Ling, or Aui_2000, is 22 and hails from Vancouver. "I'm a male in my 20s who lives in my parents' basement and plays video games all day," he says, smiling. "I am an exact stereotype."

Clinton Loomis, known as Fear, is the grand old man of the team, a living legend at 27. The years have been less than kind to him: A chronic repetitive-stress injury sidelined him from last year's International, but he's well enough to play this year. "I've been playing Dota for so many years I don't really know anything else as far as work goes," he says. "It's really fun—it's

PREVIOUS SPREAD: TIMOTHY ARCHIBALD/BLOOMBERG; THIS SPREAD: CROWD: JOHN LOOMIS; EVIL GENIUSES: KORIE YANG

my passion—but I don't know if I can keep playing."

Loomis recognizes the potential in Sumail. "He's just way more confident than most of the other people that I've played with that are younger," he says. "Some people would be nervous on the main stage because they're new. But I don't think he cares." Sumail (whose player handle is Suma1l) plays the middle lane, meaning he rushes up the center of the map alone, picking fights, while the others worm their way up either side. Middle-lane players are the team muscle—the most visible and the most vulnerable. Choosing the right time to strengthen your teammates with "vampiric aura," or drop a paralyzing cyclone on an enemy with "Eul's scepter of divinity," comes down to split-second decisions. "It requires a lot of instinct to be able to read your opponent and catch very small mistakes and use them," says Phillip Aram, the team's assistant manager. "It's crazy a kid that young can do it."

As they scrimmage online with a team from Malaysia, there's no shouting, no pounding on keyboards, no chugging of Red Bull (unopened cans of Monster Energy, a sponsor, are next to their computers). They've seen too many pretournament boot camps where teams burn out before they even start their first competition game. They're trying not to play more than two long scrimmages a day, so they don't start snapping at one another. It's a light load for Sumail, who used to play 13 or 14 hours a day in Pakistan. Between games, they talk about when the next pizza is coming. There are no plans to hit town, no talk of anything that will take them away from the computers.

After handily beating the Malaysians, Sumail kills time by watching the live-stream of a pretty girl playing a game on Twitch. It's only a brief detour. Between team games he sneaks onto public servers under a pseudonym—today's is Straight Ballin. Under his real name, Sumail can draw as many as 10,000 people to watch his live-streamed practice games. He makes money through a mixture of subscriptions, ads, and donations. That's not an option for most players. Only 40 percent make a living off gaming; Accenture consultant Prashob Menon says that on average, most e-athletes bring home about $7,000 a year in winnings. "For us, streaming money is such a small amount of the money we make," says Dager, the team captain. "There are so many tournaments. We're very busy. We have a lot of fans, but we don't have the time."

Player compensation is one of many areas where e-sports has some growing up to do. Game makers such as Valve and Los Angeles-based Riot Games still treat the pro scene as a marketing tool, not a moneymaker. Valve produces only the International, leaving others to host whatever Dota 2 tournaments they want during the year; the result is a chaotic, often punishing schedule. And the overall revenue brought in by e-sports is puny compared with, say, the $10 billion grossed by the National Football League or Major League Baseball or the $20 billion generated by European soccer leagues. The disorganized tournament schedule and the lack of standardization between games and game makers leaves most advertisers confused about what exactly they should be sponsoring.

"We're getting there, in terms of media buyers being aware of this," says Alexander Garfield, the 30-year-old founder of GoodGame, the e-sports agency that owns the Evil Geniuses team (and was acquired by Twitch in December). "But if you're a mainstream consumer brand and you decide you want to put $10 million into e-sports, it's very hard to figure out where that money should go."

To get there, says Joost van Dreunen, an e-sports analyst with SuperData Research, the game makers may need to make the games themselves more tournament-friendly and accessible as a spectator sport—streamlining the rules or making the games easier for newcomers to follow. That, of course, might risk alienating the die-hard fans who've brought it this far. Tournament hosts and streaming platforms can also do more to build stories—team rivalries, human dramas—to make trajectories like Sumail's all the more valuable. A little posturing doesn't hurt, either. As Sumail tweeted in July, just before the start of boot camp: "With every ounce of my blood, with every breath in my lungs, wont stop until I am phenomenal."

Despite the mounting pressure, Sumail doesn't let on that he's homesick. "I mean, everything here is just a better version of there," he says of his move from Pakistan. He says his parents wanted to move here for a better education, but he often says his school is easier, too. He's absorbing American culture much as any 16-year-old with a highly developed methodical nature might: Each night during boot camp, in his hotel, he picks a movie from IMDb's top 250 list and watches it. He's currently on a Robert De Niro kick. "He's, like, one of my favorite actors," he says. *Taxi Driver*'s a favorite, and so's *The Godfather: Part II*, in which the actor's steady wariness seems to match Sumail's. Tonight he's switching gears and watching *The Rock*. He spotted Alcatraz on the ride to and from his hotel. He's curious about it—though he mentions with a laugh that he's too busy in his own prison to actually visit the place.

The highlight of Sumail's practice day is when he gets to play his 18-year-old brother, Yawar, remotely in a scrimmage. Yawar hasn't gone pro, though he'd like to. "He plays more than me. He's, like, more motivated than me," Sumail says. When Yawar's team is trounced by the Evil Geniuses, Sumail seems pleased: "Pretty fun."

Asked about the Evil Geniuses' chances at the International, Sumail stops short of any bold predictions. Instead, he focuses on what he might win and what he might bring back to his family. His tone is grave now. He knows what's at stake. The whole family remains in the three-bedroom apartment, and his father, who hasn't found steady work in the U.S., isn't back from Pakistan. Two of his older siblings are in college or about to start; a third is paralyzed and needs to be cared for at home. If the Evil Geniuses win, each player's payday will be more than $1 million.

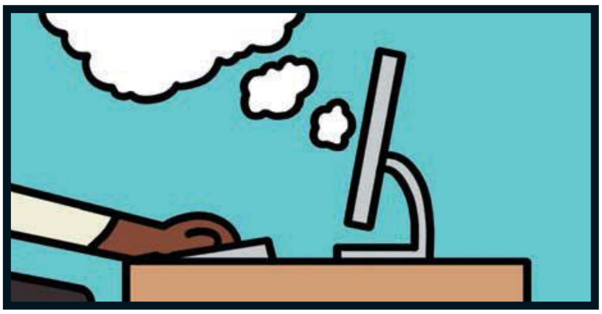
"That's a lot of money," he says. "I always wanted to buy my mother a house. That's all she wants." If nothing else, that could make all the time he spent in front of the computer back in Karachi worthwhile. "The other kids," he says with a smile, "were playing cricket." Ⓑ

EVIL GENIUSES AT THE 2015 DOTA 2 ASIA CHAMPIONSHIPS

DO

...Bring a laptop. And if you must use it, install F.lux, software that regulates the screen's tint, making it easier to see, so **your eyes won't feel heavy and strained** from staring at a bright screen outdoors.

...Answer calls, but make them quick—and **no FaceTime or video chats**. "I would only do those to make the point that staff should be enjoying time off, too," says Gary Oster, managing director at Project: Time Off.



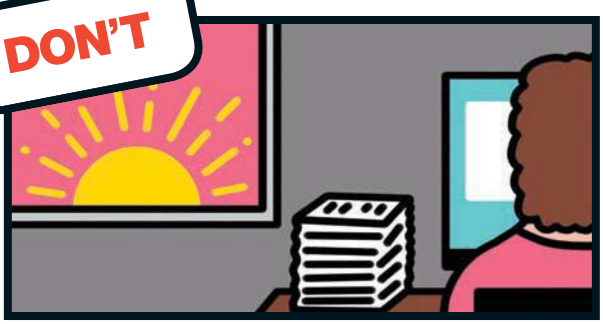
...Save all your work to the cloud so projects remain accessible. The app Quip allows shared access of documents or spreadsheets. Need something on your desktop? **Another app, Screens, logs in remotely from an iPhone.**

...Get a little crafty. If you have a private office, borrow smart-home technology: When you leave, shut the door and **use a Nest thermostat to control the lights from afar.** Tap them off at 6 p.m. from your lake house.

GET ME OUT OF HERE!

Nothing's worse than sitting in a freezing office on a slow summer Friday. But don't just throw your jacket over your chair and sneak out. Prepare your bosses—and yourself—with these strategies for a blameless early exit

DON'T



...Leave before you leave (Sheryl Sandberg reference!). Earn your exit with a productive 8 a.m. start. Or try to **schedule phone calls for Friday morning.** Clients will either bite or, ideally, move them to Thursday.

...Check e-mail every five seconds. Get the team onto a group-chat platform, such as Slack or HipChat; they have mobile apps that allow you to **set up alerts if someone says your name** or posts something important.

...Hide your weekend bag. **It signals to colleagues you're headed out early.** "I brought a backpack with a tent and kept it by my desk," says Justin LaFontaine, art director at Huge, an ad agency. "Great conversation starter."

...Be the person glued to your phone poolside, answering e-mails or blabbing with your boss in front of friends and family. Download the Breather service to **book quiet, empty office space to bang out tasks in solitude.**

By Rebecca Greenfield / Illustrations by Sam Island

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